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Togashi

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(54) **MULTILAYER CAPACITOR HAVING LOW IMPEDANCE OVER A WIDE FREQUENCY BAND**

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H01G 4/005 (2006.01)
H01G 4/06 (2006.01)
H01G 4/228 (2006.01)

(52) **U.S. Cl.** **361/303**; 361/321.2; 361/306.3

(58) **Field of Classification Search** 361/303, 361/304, 305, 308.1, 309, 321.2, 321.3, 321.4, 361/301.2, 321.5, 306.1, 306.3, 306.2
See application file for complete search history.

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(57) **ABSTRACT**

A multilayer capacitor has a capacitor element body in which a plurality of insulator layers are laminated, first and second terminal electrodes, a first internal electrode group, and a second internal electrode group. The first and second terminal electrodes are disposed on an external surface extending in a direction parallel to a laminating direction of the insulator layers, among external surfaces of the capacitor element body. The first internal electrode group has a first internal electrode connected to the first terminal electrode, and a second internal electrode connected to the second terminal electrode. The second internal electrode group has a third internal electrode connected to the first terminal electrode, a fourth internal electrode connected to the second terminal electrode, and at least one intermediate internal electrode not connected to the first and second terminal electrodes. The first and second internal electrodes are arranged with the insulator layer in between so as to form a capacitance component between the first and second internal electrodes. The third and fourth internal electrodes and the intermediate internal electrode are arranged with the insulator layer in between so as to form two or more capacitance components between the third and fourth internal electrodes.

14 Claims, 19 Drawing Sheets

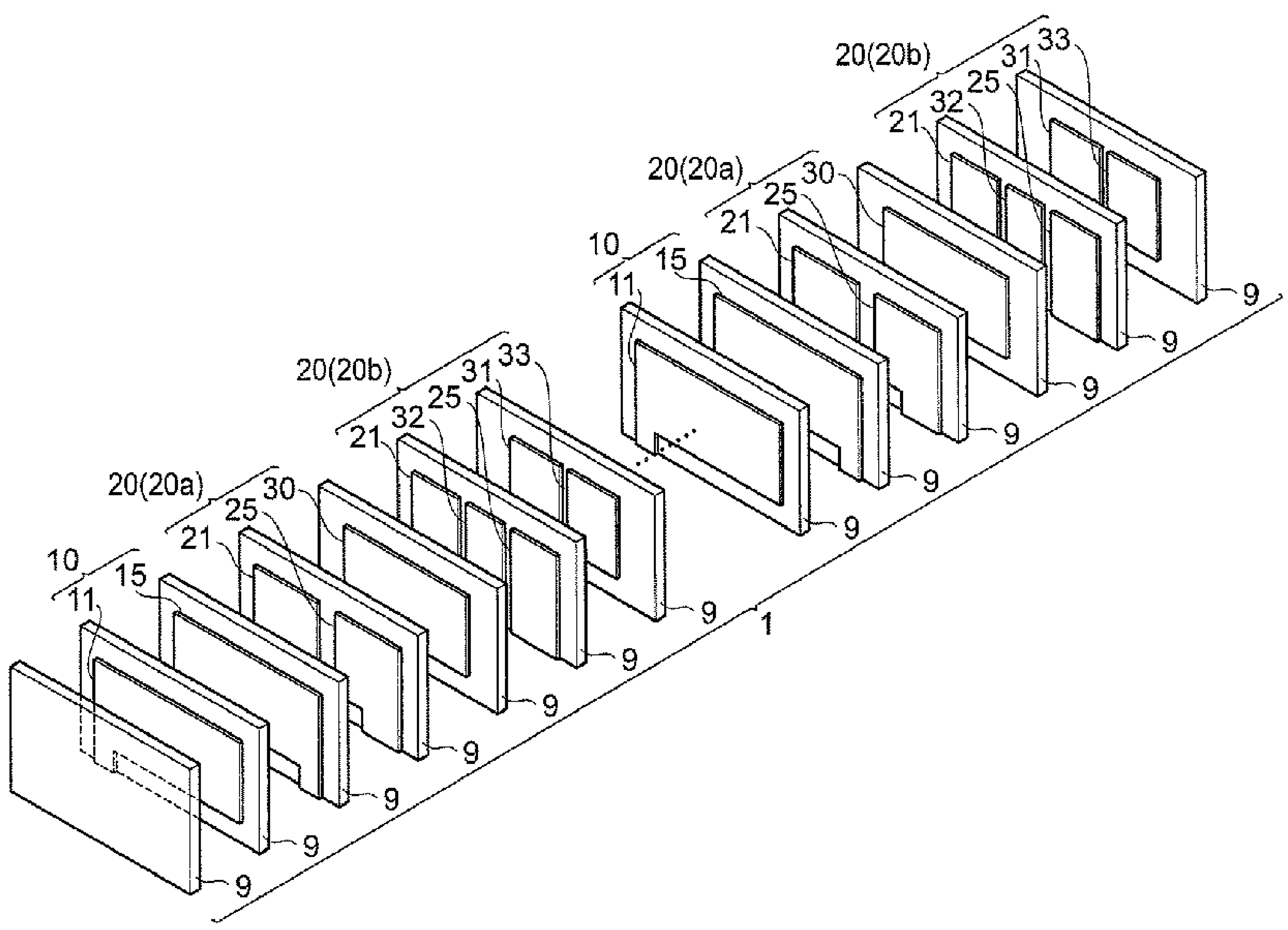


Fig.1

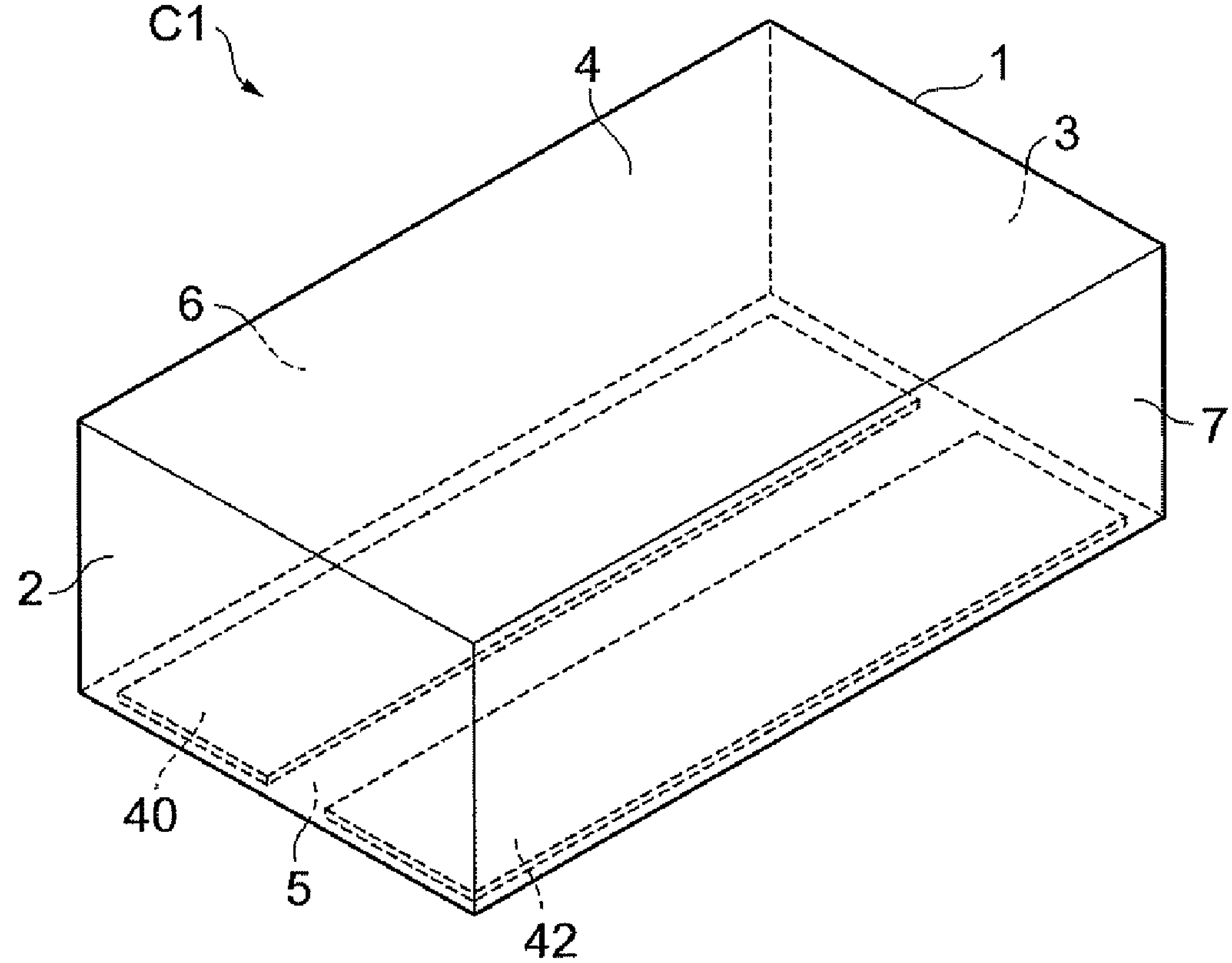


Fig.2

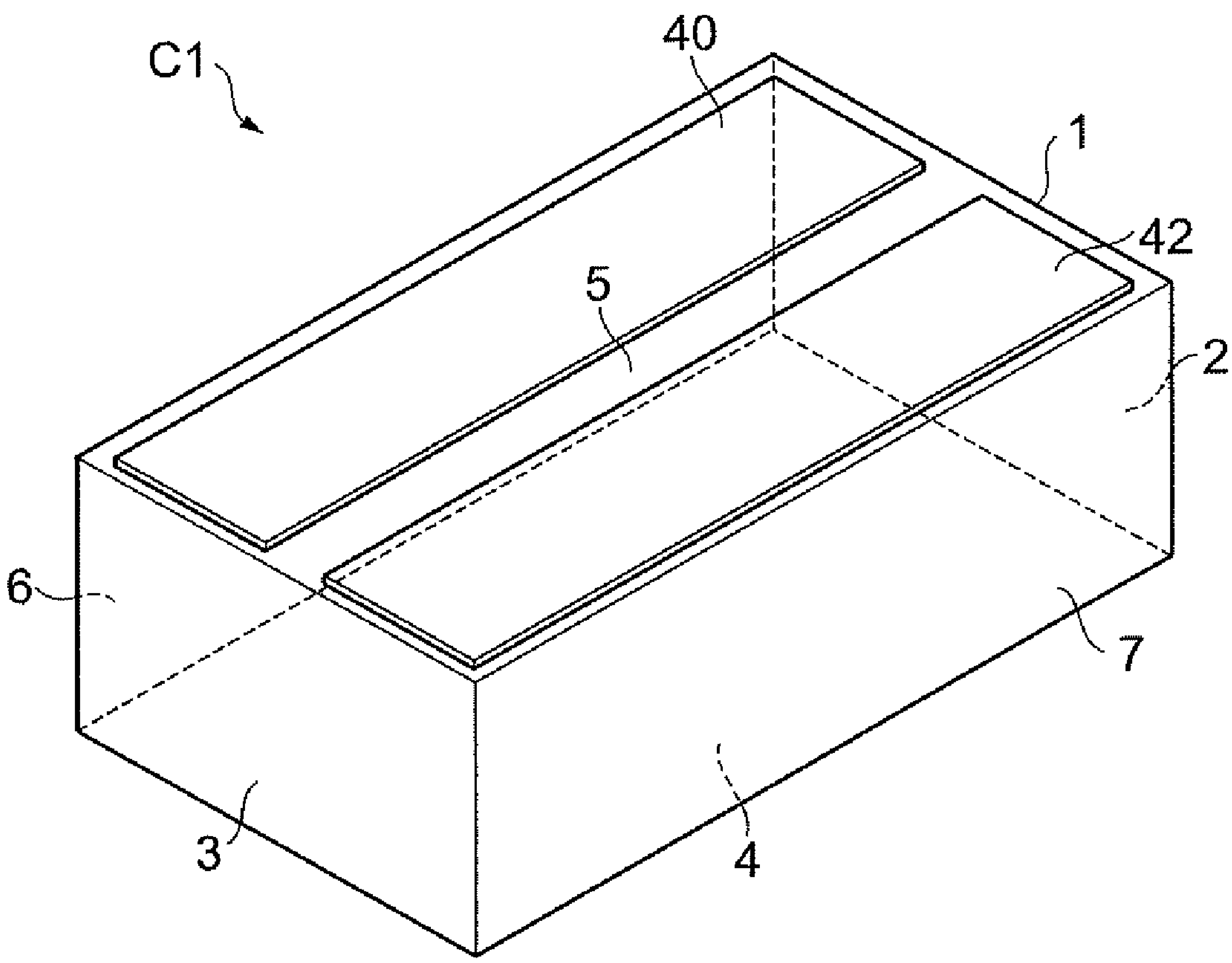


Fig.3

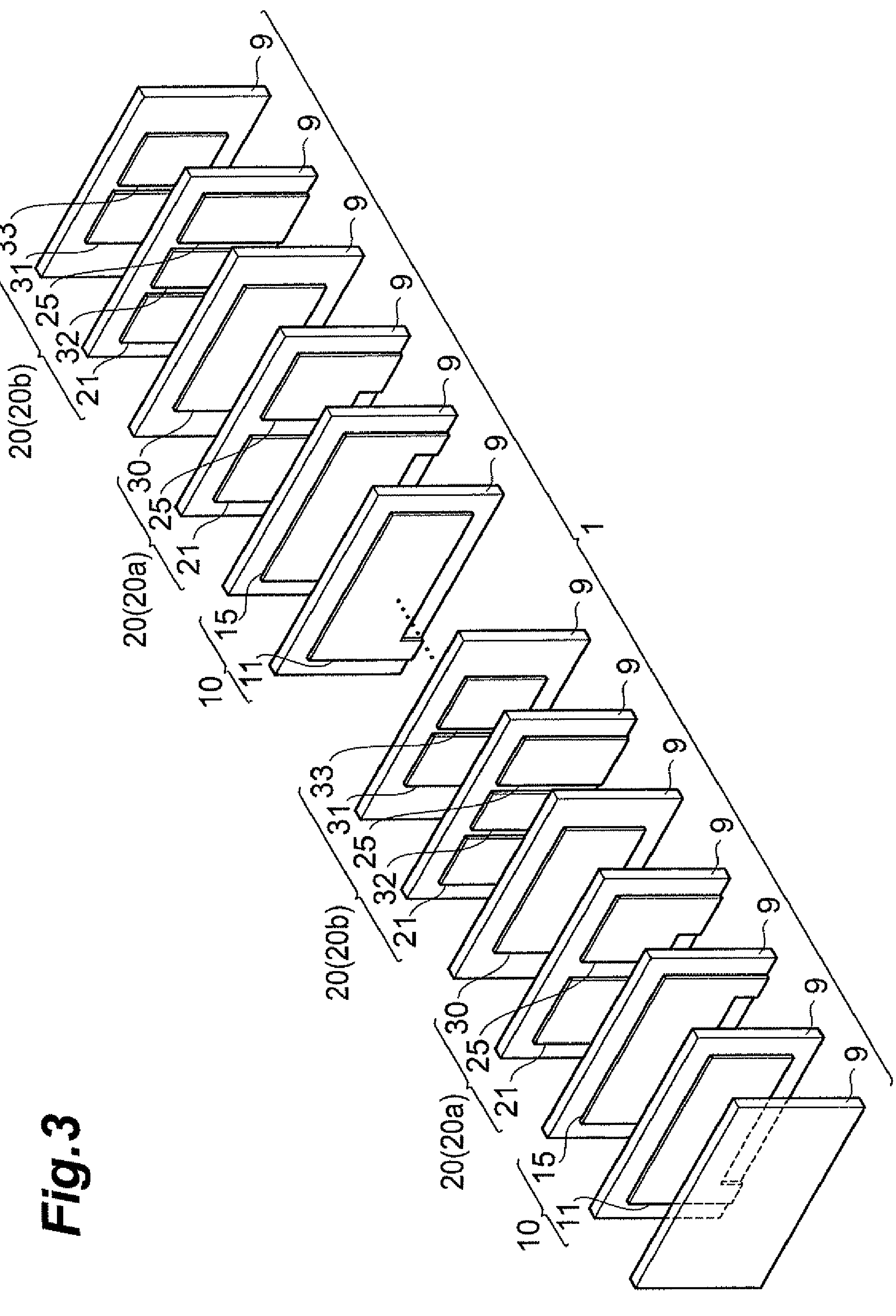


Fig.4

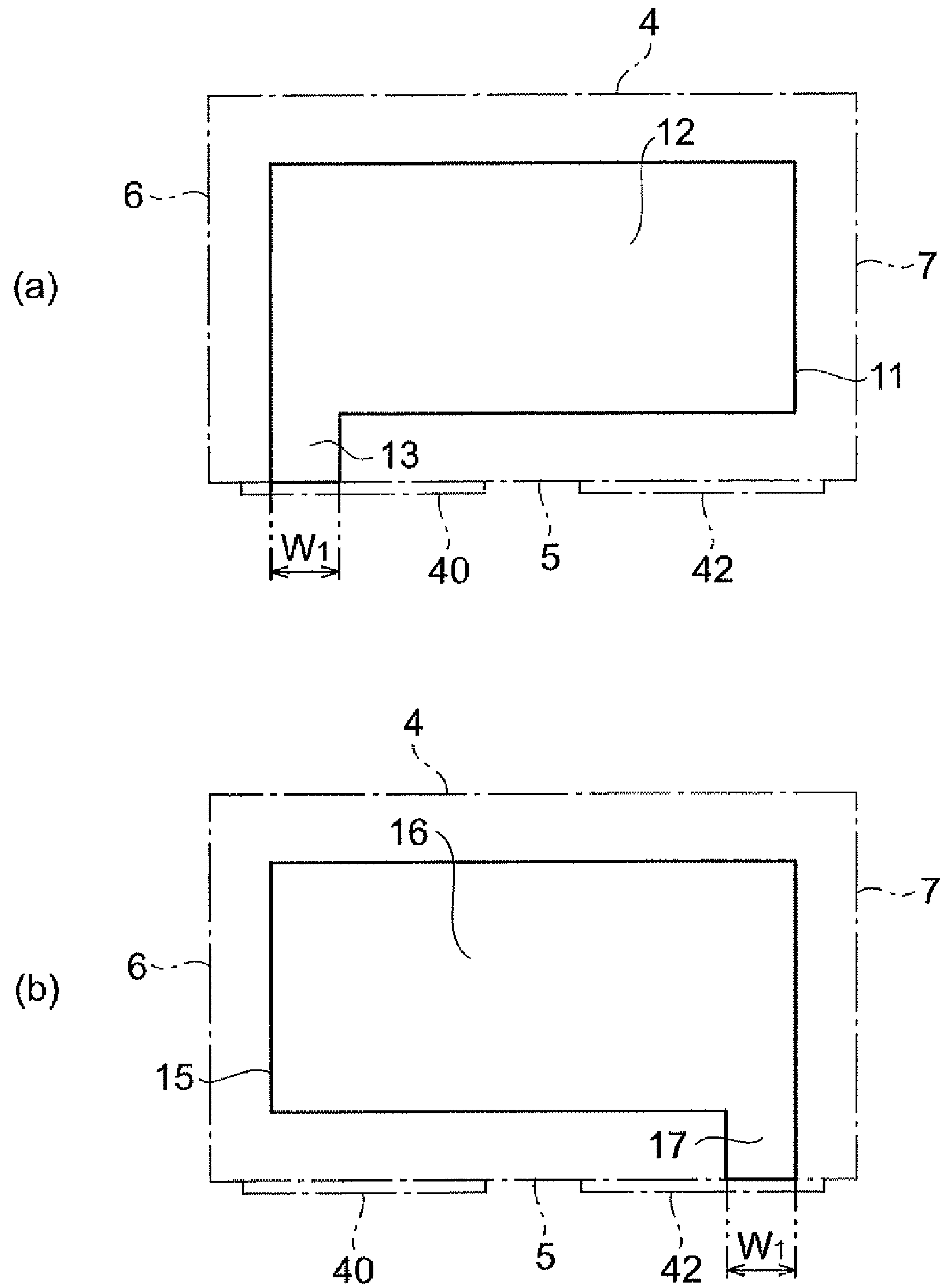


Fig.5

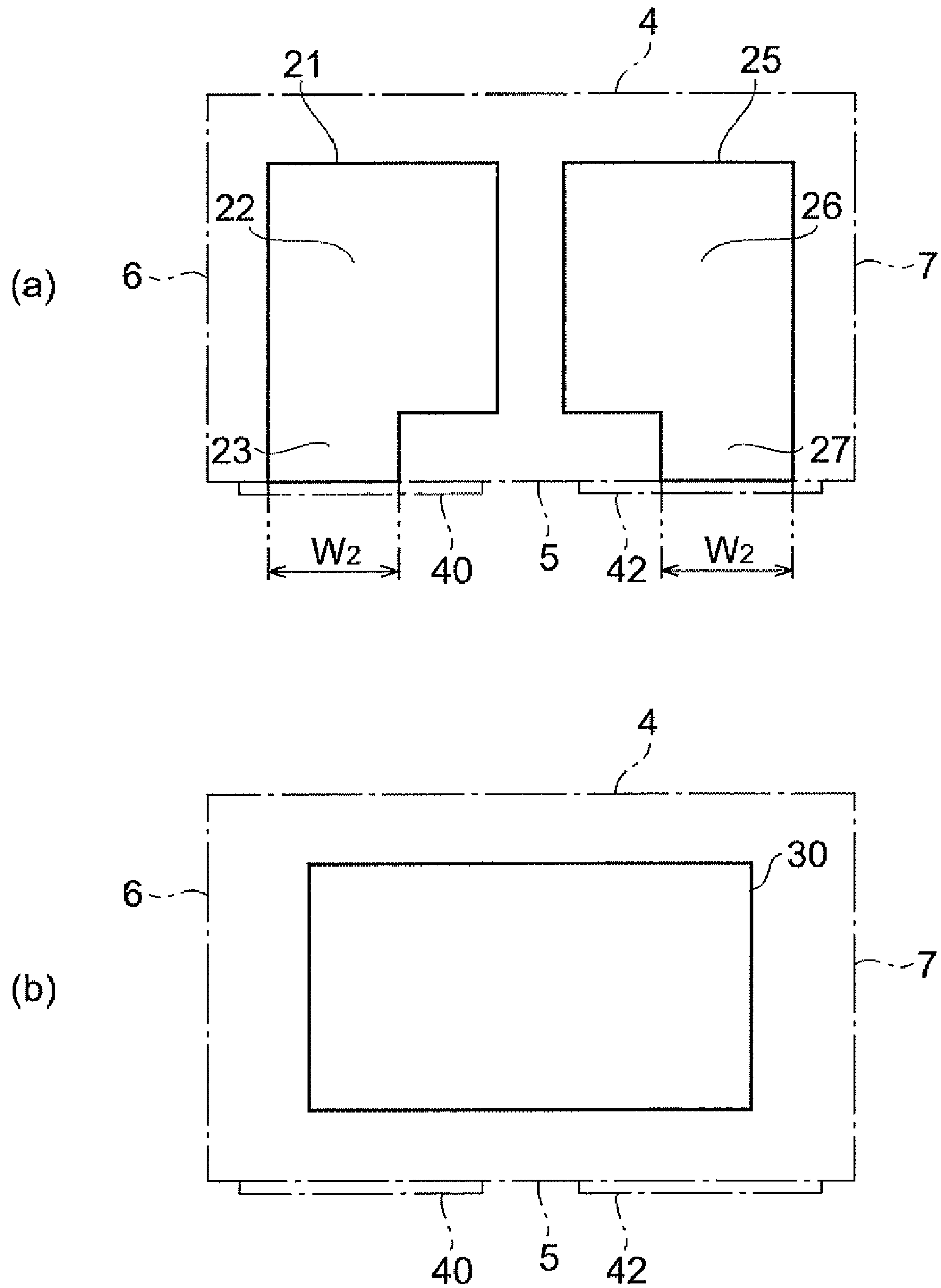


Fig.6

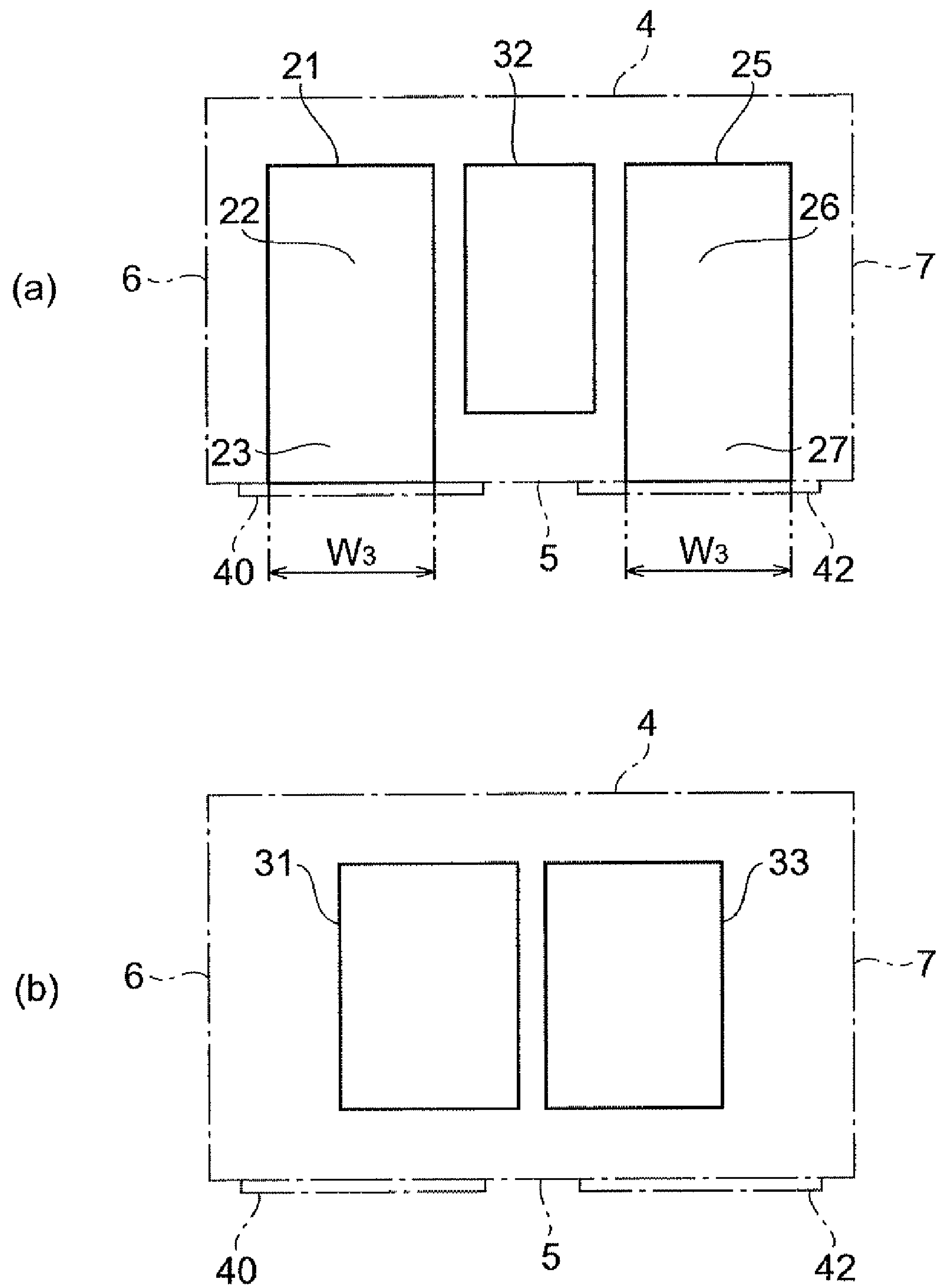


Fig.7

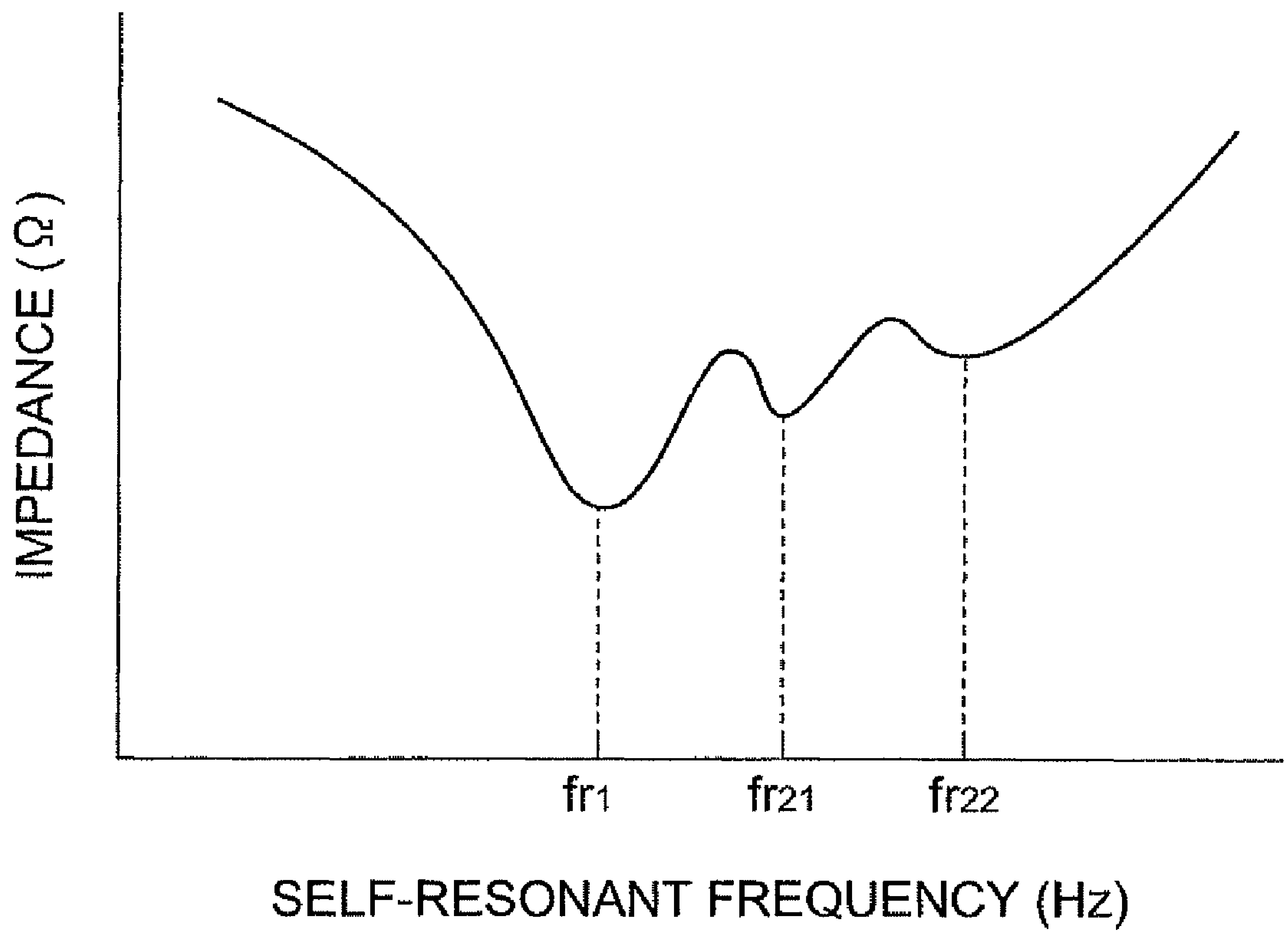


Fig.8

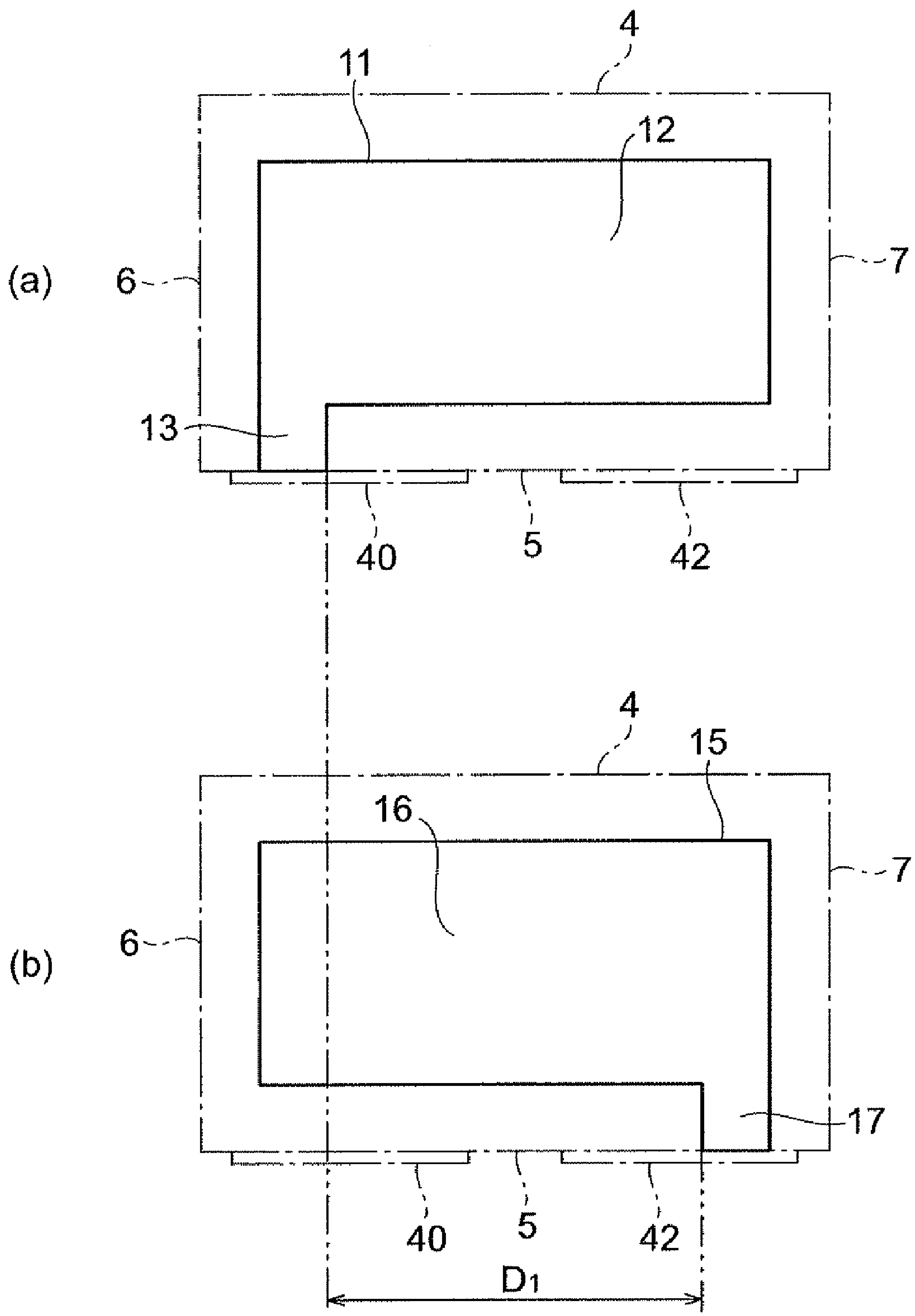


Fig.9

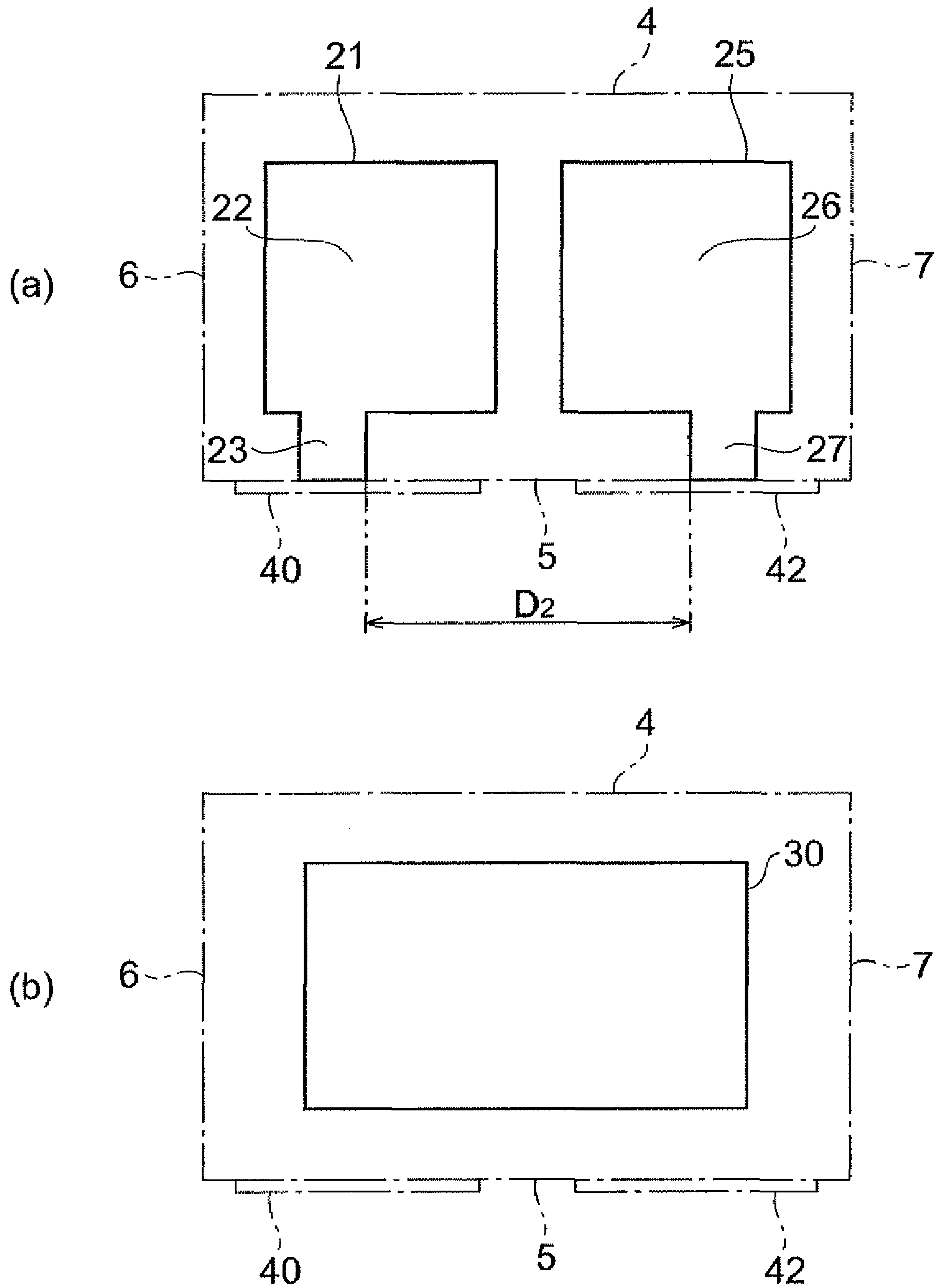


Fig.10

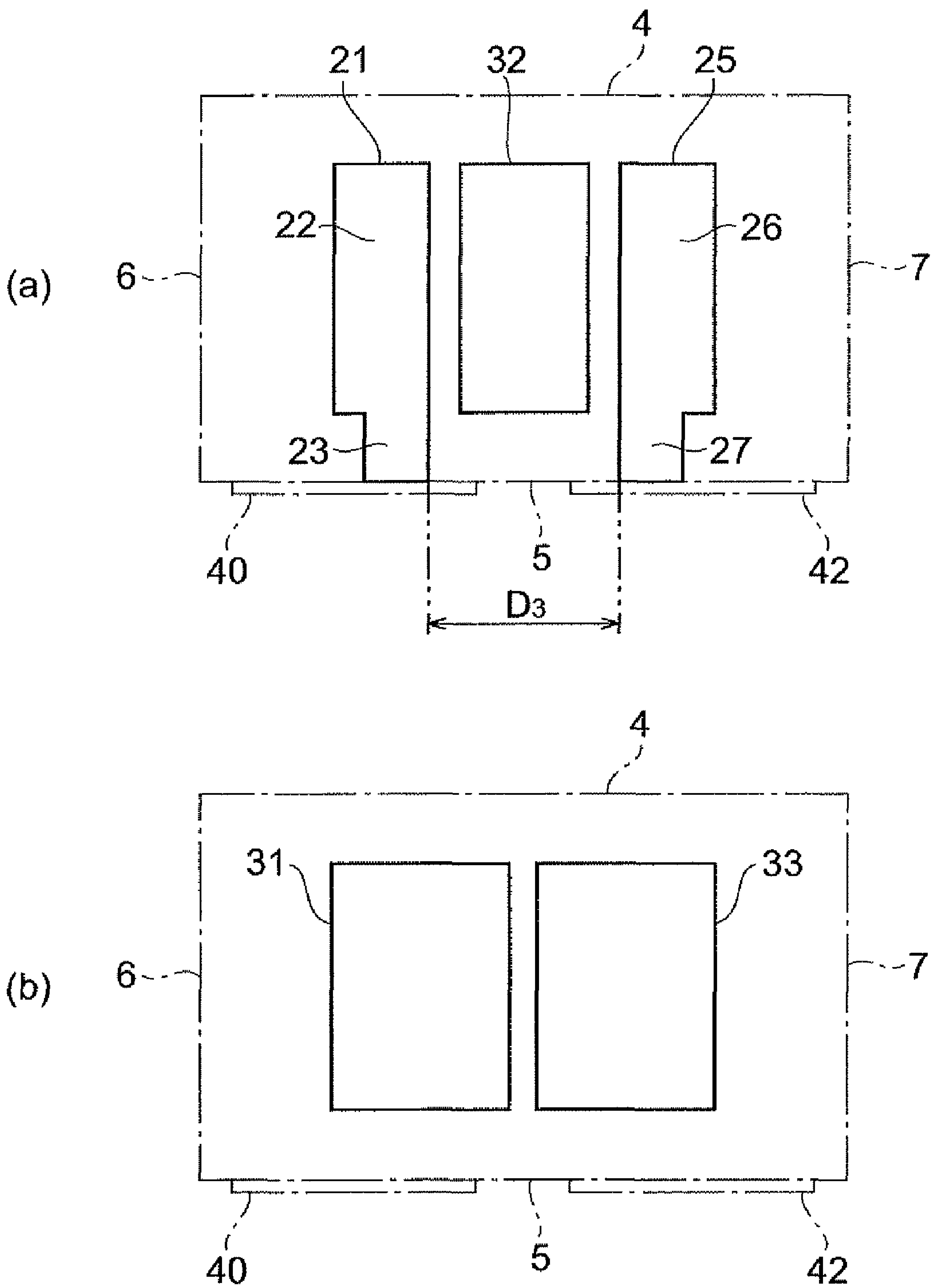
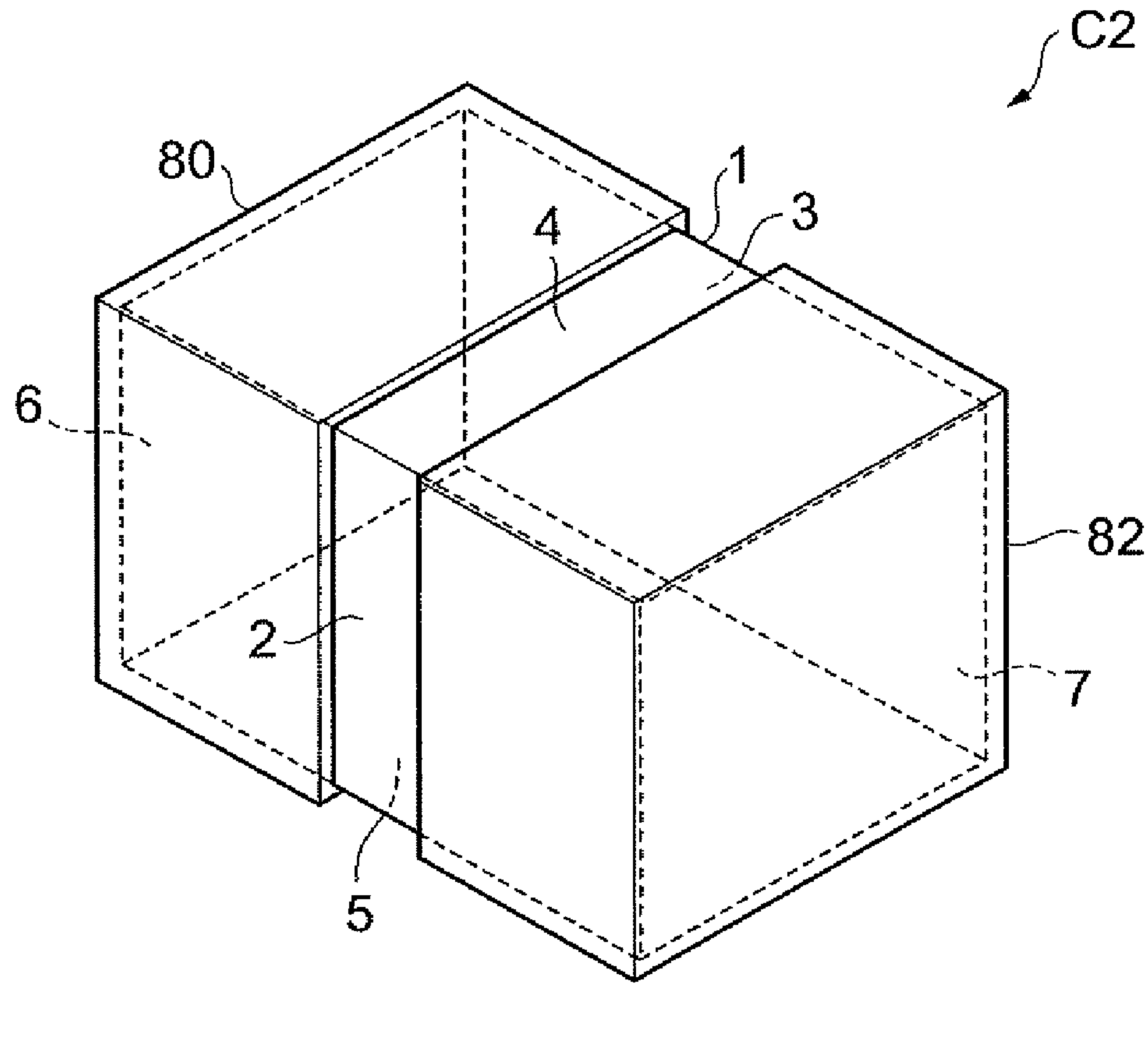


Fig.11



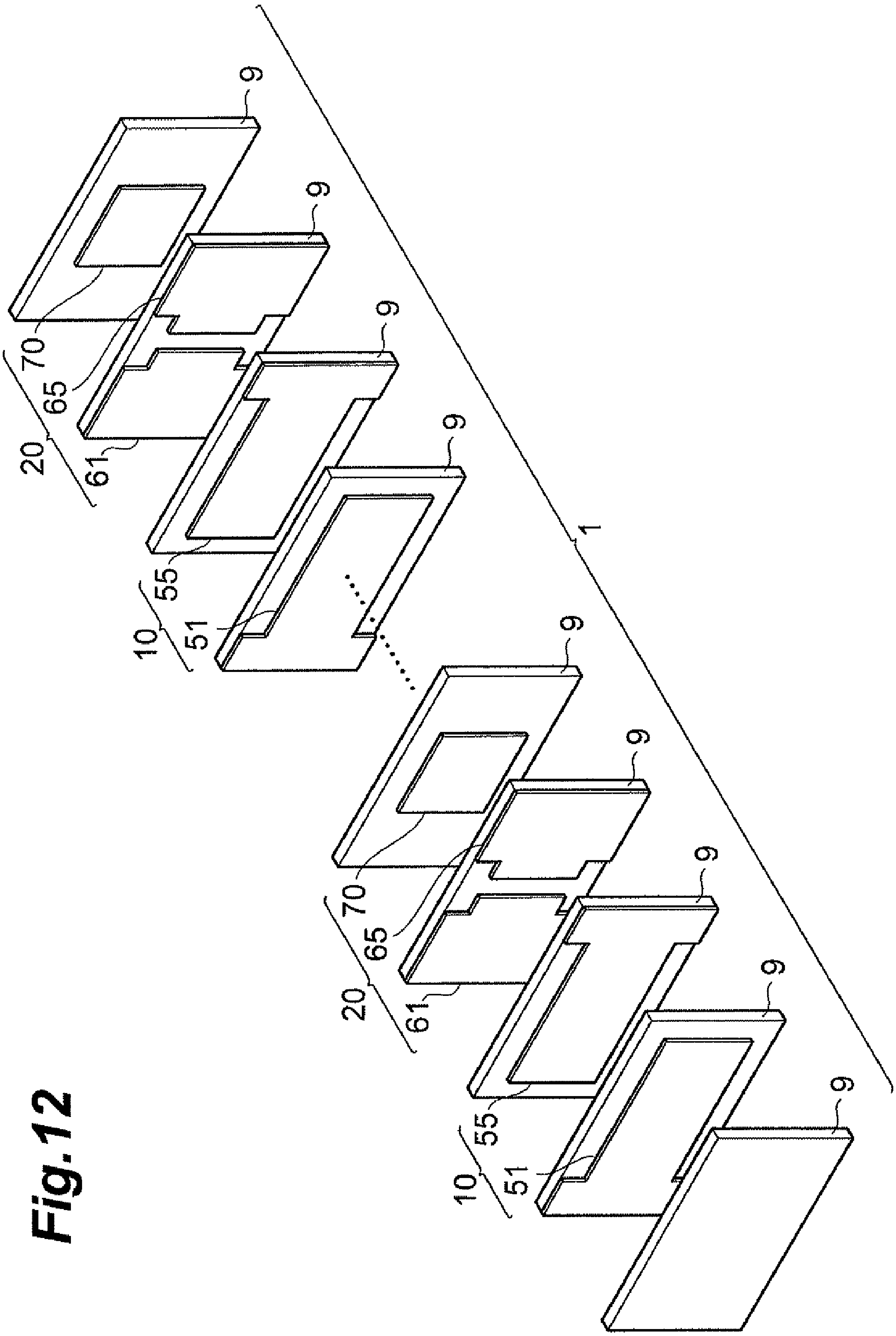


Fig.12

Fig.13

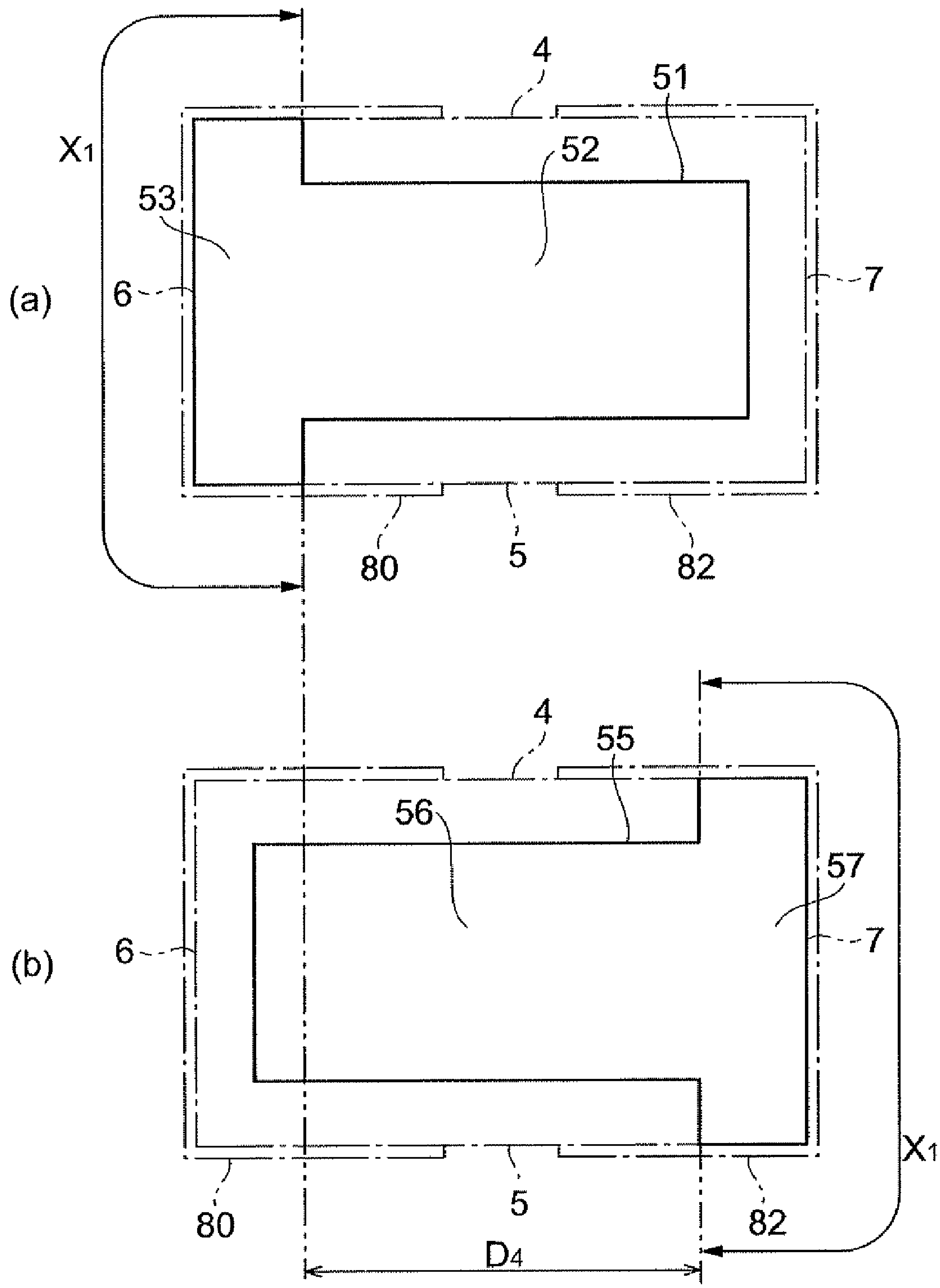


Fig.14

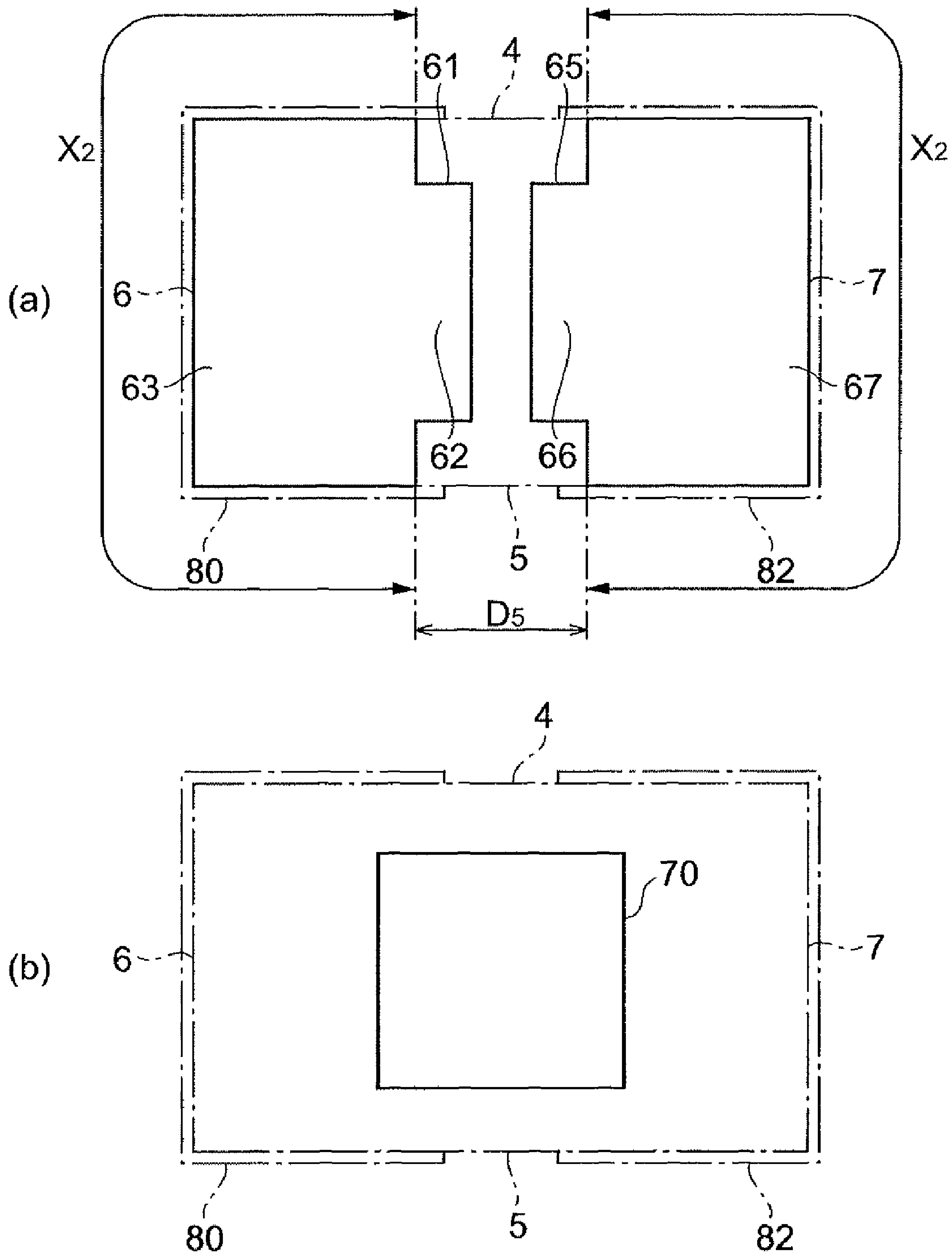


Fig.15

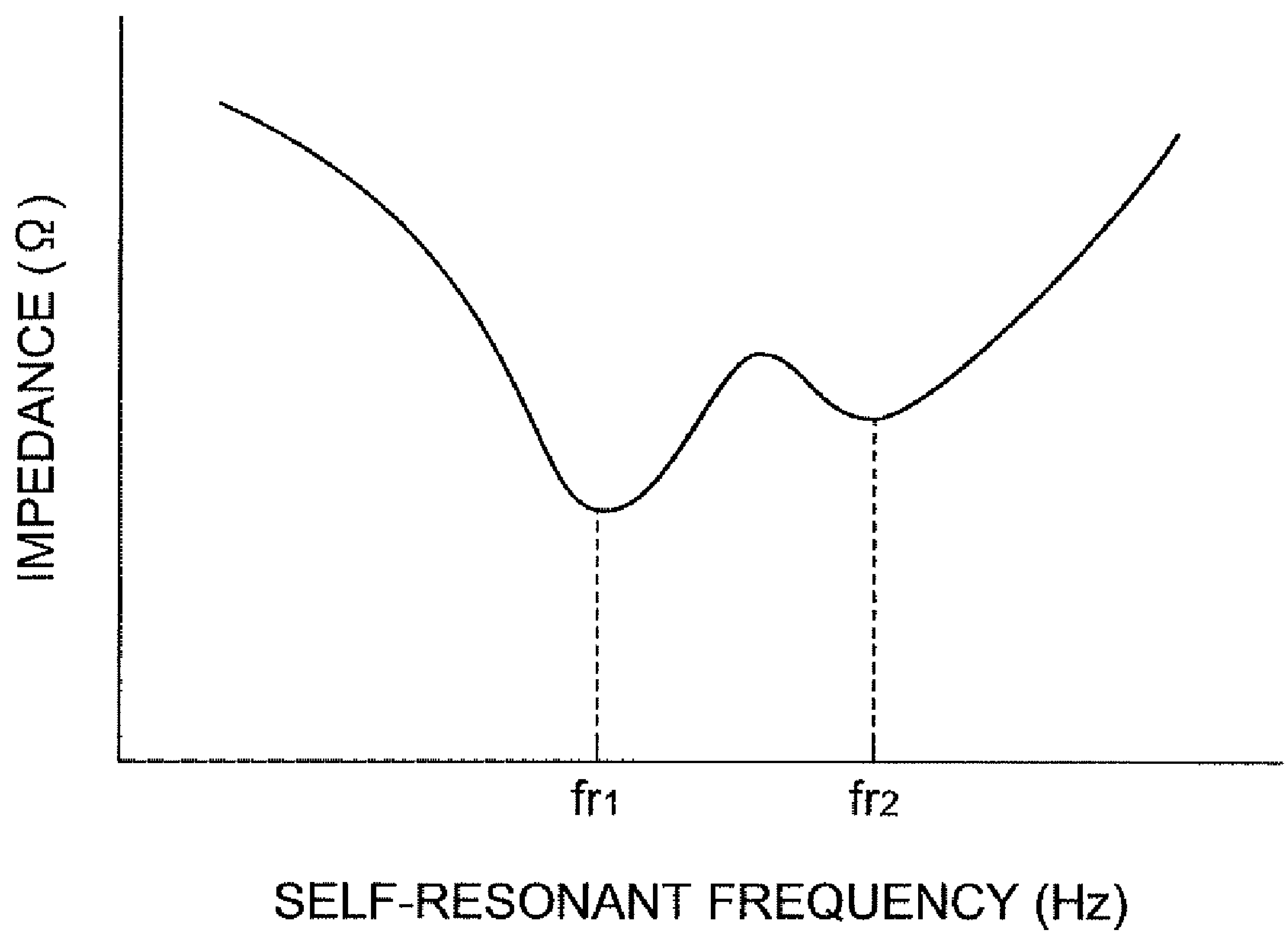


Fig.16

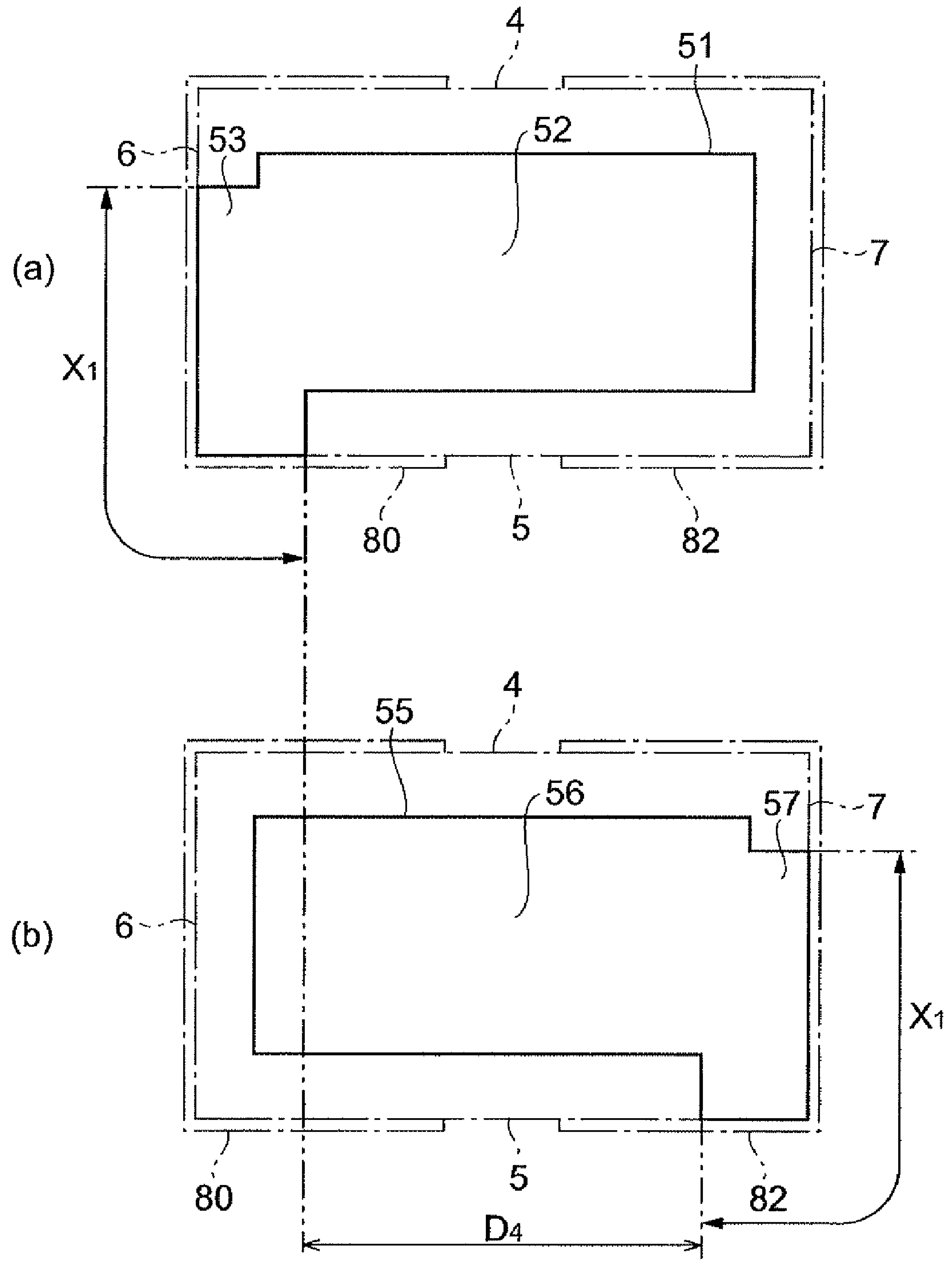


Fig.17

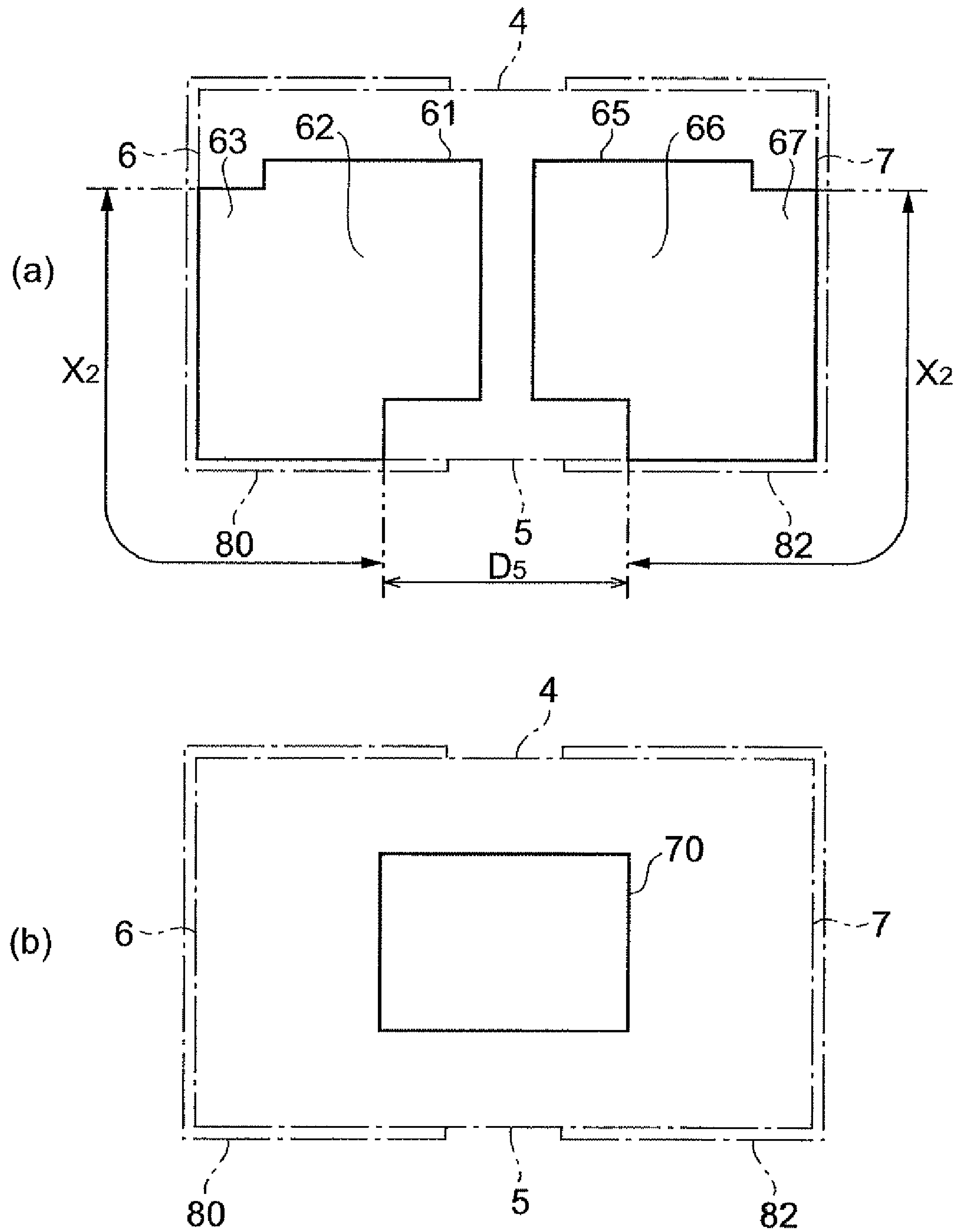


Fig.18

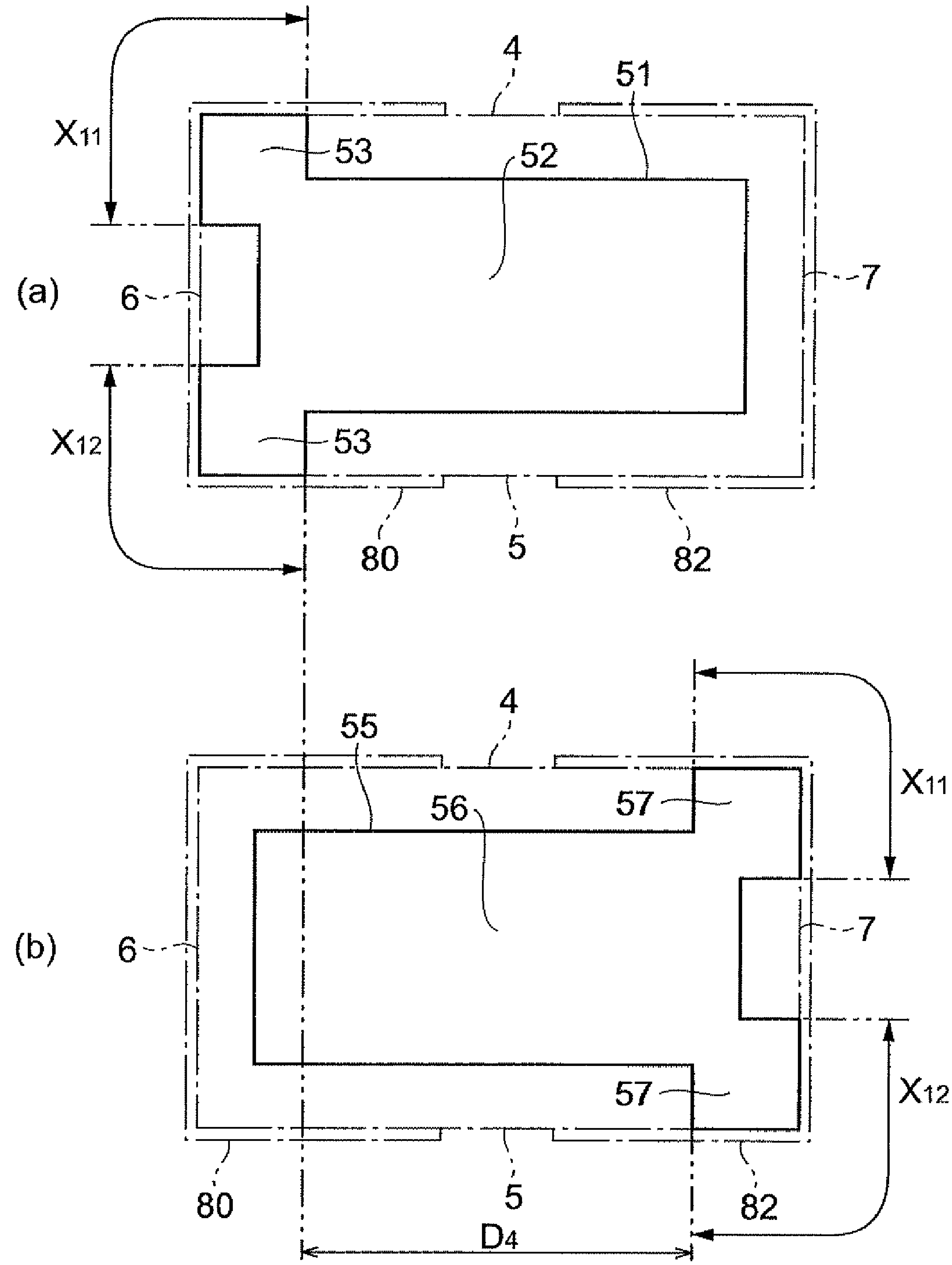
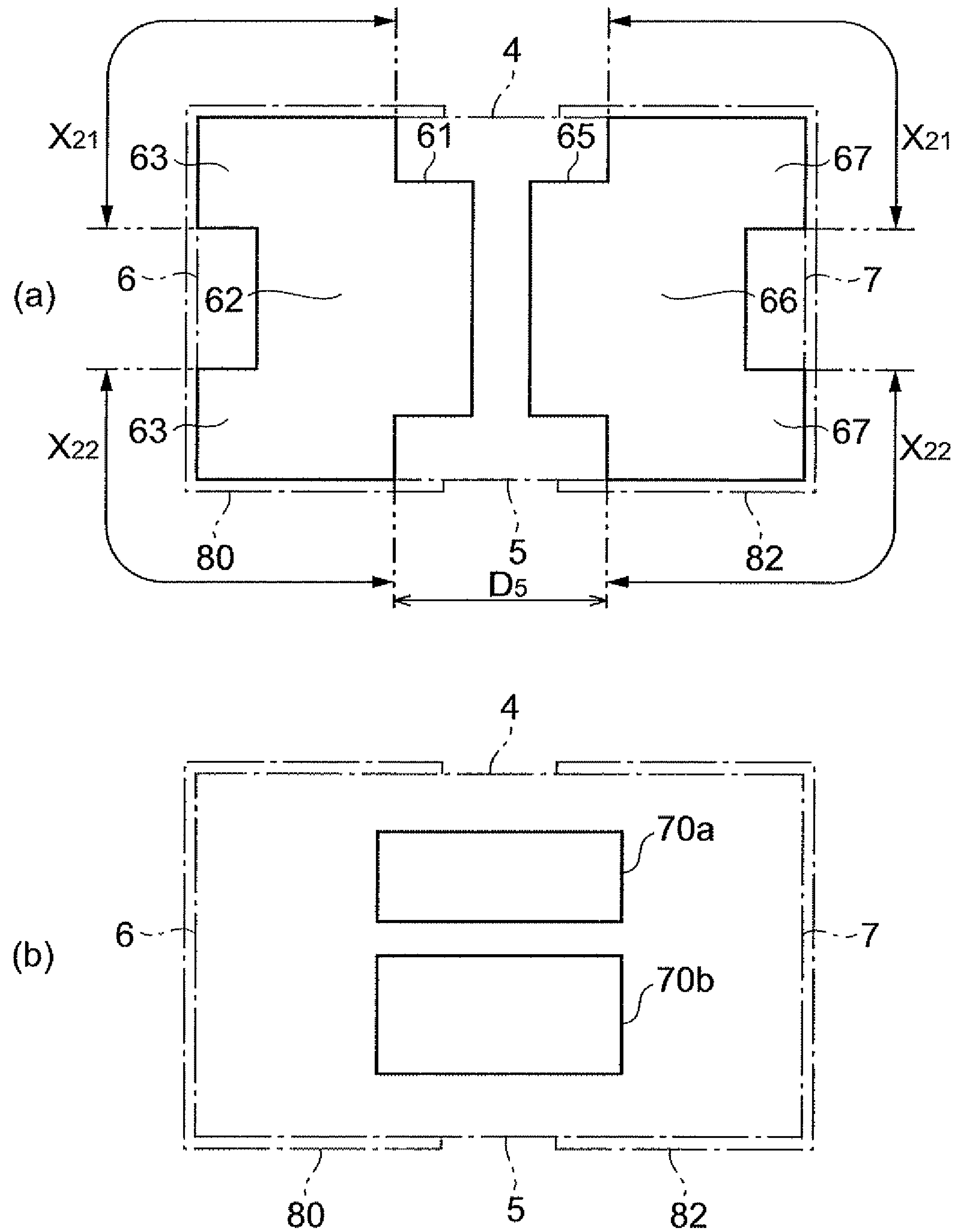


Fig.19


4
61
65
X21
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X21
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D5
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70a
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(b)
7
70b
80
5
82

MULTILAYER CAPACITOR HAVING LOW IMPEDANCE OVER A WIDE FREQUENCY BAND

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a multilayer capacitor.

2. Related Background Art

A known multilayer capacitor is one having a capacitor element body in which a plurality of insulator layers are laminated, a plurality of first internal electrodes and second internal electrodes arranged as opposed with the insulator layer in between, and first and second terminal electrodes disposed on an external surface extending in a direction parallel to a laminating direction of the insulator layers, among external surfaces of the capacitor element body, wherein the plurality of first internal electrodes are connected to the first terminal electrode and wherein the plurality of second internal electrodes are connected to the second terminal electrode (e.g., cf. Japanese Patent Application Laid-open No. 2004-140183). Since the first and second terminal electrodes are disposed on the same external surface in the ceramic electronic component described in Japanese Patent Application Laid-open No. 2004-140183, current pathways established in the multilayer capacitor are relatively short, so that the equivalent series inductance (ESL) can be reduced.

SUMMARY OF THE INVENTION

Incidentally, the multilayer capacitor to be connected to a power-supply circuit or the like in electronic equipment in order to remove noise is required to produce the noise removal effect over a wide frequency band. For this reason, the multilayer capacitor of this type is required to have low impedance over a wide band, in order to effectively remove noise in the wide frequency band. In the multilayer capacitor described in Japanese Patent Application Laid-open No. 2004-140183, however, nothing is considered for reduction in impedance over the wide band. Therefore, the multilayer capacitor described in the mentioned Laid-open No. 2004-140183 fails to achieve reduction in impedance over the wide band and it can be difficult to effectively remove noise in the wide frequency band.

The present invention has been accomplished in order to solve the above-described problem and an object of the present invention is to provide a multilayer capacitor having low impedance over a wide band, while keeping the equivalent series inductance low.

A multilayer capacitor according to the present invention is a multilayer capacitor comprising: a capacitor element body in which a plurality of insulator layers are laminated; first and second terminal electrodes disposed on an external surface extending in a direction parallel to a laminating direction of the insulator layers, among external surfaces of the capacitor element body; a first internal electrode group comprising a first internal electrode connected to the first terminal electrode, and a second internal electrode connected to the second terminal electrode; and a second internal electrode group comprising a third internal electrode connected to the first terminal electrode, a fourth internal electrode connected to the second terminal electrode, and at least one intermediate internal electrode not connected to the first and second terminal electrodes; wherein the first and second internal electrodes are arranged with the insulator layer in between so as to form one capacitance component between the first and second internal electrodes; and wherein the third and fourth

internal electrodes and the intermediate internal electrode are arranged with the insulator layer in between so as to form two or more capacitance components between the third and fourth internal electrodes.

In the multilayer capacitor according to the present invention, the one capacitance component is formed in the first internal electrode group and the two or more capacitance components are formed in the second internal electrode group. In this case, the two or more capacitance components are connected in series, and thus the total capacitance of the two or more capacitance components is smaller than the capacitance of the one capacitance component. Therefore, the self-resonant frequency due to the one capacitance component in the first internal electrode group is different from that due to the two or more capacitance components in the second internal electrode group, whereby low impedance is achieved over a wide frequency band. The self-resonant frequency due to the two or more capacitance components is higher than that due to the one capacitance component because the total capacitance of the two or more capacitance components is smaller than the capacitance of the one capacitance component.

Since in the present invention the first and second terminal electrodes are disposed on the one external surface, current pathways established in the multilayer capacitor are relatively short, so that the equivalent series inductance of the multilayer capacitor can be reduced.

Preferably, the second internal electrode group comprises a first intermediate internal electrode opposed to the third and fourth internal electrodes, as the at least one intermediate internal electrode. The multilayer capacitor is also preferably configured as follows: the second internal electrode group comprises second to fourth intermediate internal electrodes as the at least one intermediate internal electrode, the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

Preferably, the second internal electrode group includes two types of internal electrode groups, an internal electrode group having a first intermediate internal electrode and an internal electrode group having second to fourth intermediate internal electrodes, the first intermediate internal electrode is opposed to the third and fourth internal electrodes, the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode. In this case, the second internal electrode group includes the two types of internal electrode groups, whereby low impedance is achieved over a wider frequency band. The number of capacitance components connected in series is larger in the internal electrode group having the second to fourth intermediate internal electrodes than in the internal electrode group having the first intermediate internal electrode, and the total capacitance thereof is thus smaller. Therefore, the self-resonant frequency due to the one capacitance component in the first internal electrode group, the self-resonant frequency due to the two or more capacitance components in the internal electrode group having the first intermediate internal electrode, and the self-resonant frequency due to the two or more capacitance components in the internal electrode group having the second to fourth intermediate internal electrodes are different from each other.

Preferably, the first internal electrode has a first lead portion connected to the first terminal electrode, the second internal electrode has a second lead portion connected to the second terminal electrode, the third internal electrode has a third lead portion connected to the first terminal electrode, the fourth internal electrode has a fourth lead portion connected to the second terminal electrode, and a width of the third and fourth lead portions is larger than a width of the first and second lead portions. In this case, the equivalent series inductance of the two or more capacitance components in the second internal electrode group is lower than the equivalent series inductance of the one capacitance component in the first internal electrode group. As a consequence, it becomes feasible to further reduce the equivalent series inductance of the multilayer capacitor.

Incidentally, the equivalent series inductance can also be reduced by setting the width of the first and second lead portions wider than the width of the third and fourth lead portions. In general, the self-resonant frequency of a capacitor becomes higher with decrease in the equivalent series inductance of the capacitor. Therefore, when the width of the first and second lead portions is larger than the width of the third and fourth lead portions, the self-resonant frequency due to the one capacitance component becomes close to the self-resonant frequency due to the two or more capacitance components, which inhibits the reduction in impedance over the wide band.

Preferably, the first internal electrode has a first lead portion connected to the first terminal electrode, the second internal electrode has a second lead portion connected to the second terminal electrode, the third internal electrode has a third lead portion connected to the first terminal electrode, the fourth internal electrode has a fourth lead portion connected to the second terminal electrode, and a distance between the third lead portion and the fourth lead portion is smaller than a distance between the first lead portion and the second lead portion. In this case, the equivalent series inductance of the two or more capacitance components in the second internal electrode group is lower than the equivalent series inductance of the one capacitance component in the first internal electrode group. As a result, it becomes feasible to further reduce the equivalent series inductance of the multilayer capacitor.

Incidentally, the equivalent series inductance can also be reduced by setting the distance between the first lead portion and the second lead portion smaller than the distance between the third lead portion and the fourth lead portion. The self-resonant frequency of a capacitor becomes higher with decease in the equivalent series inductance of the capacitor, as described above. Therefore, when the distance between the first lead portion and the second lead portion is smaller than the distance between the third lead portion and the fourth lead portion, the self-resonant frequency due to the one capacitance component becomes close to that due to the two or more capacitance components, which inhibits the reduction in impedance over the wide band.

Preferably, the first and second internal electrode groups are arranged along the laminating direction of the insulator layers in the capacitor element body.

Preferably, the external surface on which the first and second terminal electrodes are disposed constitutes a mounted surface to be opposed to another component.

The present invention successfully provides the multilayer capacitor having low impedance over a wide band while keeping the equivalent series inductance low.

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not to be considered as limiting the present invention.

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic perspective view showing a multilayer capacitor according to the first embodiment.

FIG. **2** is a schematic perspective view showing the multilayer capacitor according to the first embodiment.

FIG. **3** is an exploded perspective view of a capacitor element body in the multilayer capacitor according to the first embodiment.

FIG. **4** is a drawing showing configurations of internal electrodes.

FIG. **5** is a drawing showing configurations of internal electrodes.

FIG. **6** is a drawing showing configurations of internal electrodes.

FIG. **7** is a graph showing frequency characteristics of impedance in the multilayer filter of the first embodiment.

FIG. **8** is a drawing showing configurations of respective internal electrodes in a modification example of the first embodiment.

FIG. **9** is a drawing showing configurations of respective internal electrodes in the modification example of the first embodiment.

FIG. **10** is a drawing showing configurations of respective internal electrodes in the modification example of the first embodiment.

FIG. **11** is a schematic perspective view showing a multilayer capacitor according to the second embodiment.

FIG. **12** is an exploded perspective view of a capacitor element body in the multilayer capacitor according to the second embodiment.

FIG. **13** is a drawing showing configurations of internal electrodes.

FIG. **14** is a drawing showing configurations of internal electrodes.

FIG. **15** is a graph showing frequency characteristics of impedance in the multilayer filter of the second embodiment.

FIG. **16** is a drawing showing configurations of respective internal electrodes in a modification example of the second embodiment.

FIG. **17** is a drawing showing configurations of respective internal electrodes in the modification example of the second embodiment.

FIG. **18** is a drawing showing configurations of respective internal electrodes in another modification example of the second embodiment.

FIG. **19** is a drawing showing configurations of respective internal electrodes in the modification example of the second embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention will be described below in detail with reference to the accompanying drawings. In the description the same elements or elements with the same functionality will be denoted by the same reference symbols, without redundant description.

First Embodiment

A configuration of a multilayer capacitor C**1** according to the first embodiment will be described with reference to FIGS. **1** to **6**. FIG. **1** and FIG. **2** are schematic perspective views showing the multilayer capacitor according to the first embodiment. FIG. **3** is an exploded perspective view of a capacitor element body in the multilayer capacitor of the first embodiment. In FIGS. **4** to **6** each of (a) and (b) is a view showing a configuration of an internal electrode.

The multilayer capacitor C**1**, as shown in FIGS. **1** and **2**, is provided with a capacitor element body **1** of a nearly rectangular parallelepiped shape, a first terminal electrode **40**, and a second terminal electrode **42**.

The capacitor element body **1** includes a first end face **2** and a second end face **3** facing each other, a first side face **4** and a second side face **5** facing each other, and a third side face **6** and a fourth side face **7** facing each other. The first side face **4** and the second side face **5** extend in a first direction in which the first and second end faces **2**, **3** face each other, so as to connect the first and second end faces **2**, **3**. The third side face **6** and the fourth side face **7** extend in the first direction in which the first and second end faces **2**, **3** face each other, so as to connect the first and second end faces **2**, **3**. The first direction, a second direction in which the first and second side faces **4**, **5** face other, and a third direction in which the third and fourth side faces **6**, **7** face each other, are orthogonal to each other. In the present embodiment the second side face **5** is a mounted surface to be opposed to another component (e.g., a circuit board, an electronic component, or the like).

The capacitor element body **1**, as shown in FIG. **3**, has a plurality of insulator layers **9**. The capacitor element body **1** is composed of a laminate in which the insulator layers **9** are laminated in the first direction in which the first and second end faces **2**, **3** face each other, and has the dielectric property. Each insulator layer **9** is composed, for example, of a sintered body of a ceramic green sheet containing a dielectric ceramic (a dielectric ceramic such as a $BaTiO_3$ type ceramic, a $Ba(Ti, Zr)O_3$ type ceramic, or a $(Ba, Ca)TiO_3$ type ceramic). The insulator layers **9** are integrally formed in the practical multilayer capacitor C**1** so that no border can be visually recognized between them.

The multilayer capacitor C**1**, as shown in FIG. **3**, is provided with a plurality of first internal electrode groups **10** and a plurality of second internal electrode groups **20**. Each first internal electrode group **10** has a first internal electrode **11** and a second internal electrode **15**. Each second internal electrode group **20** has a third internal electrode **21**, a fourth internal electrode **25**, and a first intermediate internal electrode **30**, or, the third internal electrode **21**, the fourth internal electrode **25**, a second intermediate internal electrode **31**, a third intermediate internal electrode **32**, and a fourth intermediate internal electrode **33**. The internal electrodes **11**, **15**, **21**, **25**, **30-33** (first internal electrode groups **10** and second internal electrode groups **20**) each are located inside the capacitor element body **1**. The first and second internal electrode groups **10**, **20** are arranged along the first direction in the capacitor element body **1**. Each internal electrode **11**, **15**, **21**, **25**, **30-33** is made of an electrically conductive material (e.g., a base metal Ni, or the like) usually used as internal electrodes in a multilayer electric element. Each internal electrode **11**, **15**, **21**, **25**, **30-33** is constructed as a sintered body of an electroconductive paste containing the above-described electrically conductive material.

Each first internal electrode **11**, as shown in FIG. **4**(*a*), has a main electrode portion **12**, and a first lead portion **13** extending from the main electrode portion **12** so that an end thereof is exposed in the second side face **5**. The main electrode portion **12** and the first lead portion **13** are integrally formed. The first lead portion **13** extends from a portion near the third side face **6** in the longer side of the main electrode portion **12** on the second side face **5** side, to the second side face **5**.

Each second internal electrode **15**, as shown in FIG. **4**(*b*), has a main electrode portion **16** of a rectangular shape, and a second lead portion **17** extending from the main electrode portion **16** so that an end thereof is exposed in the second side face **5**. The main electrode portion **16** and the second lead portion **17** are integrally formed. The second lead portion **17** extends from a portion near the fourth side face **7** in the longer side of the main electrode portion **16** on the second side face **5**, to the second side face **5**.

The main electrode portion **12** of the first internal electrode **11** and the main electrode portion **16** of the second internal electrode **15** are opposed to each other with the insulator layer **9** in between. An overlap of the insulator layer **9** with the main electrode portion **12** of the first internal electrode **11** and the main electrode portion **16** of the second internal electrode **15** is a region that substantially produces one capacitance component. Namely, the first internal electrode **11** and the second internal electrode **15** are arranged with the insulator layer **9** in between so as to form one capacitance component between the first and second internal electrodes **11**, **15**.

Each third internal electrode **21**, as shown in FIG. **5**(*a*), has a main electrode portion **22** of a rectangular shape, and a third lead portion **23** extending from the main electrode portion **22** so that an end thereof is exposed in the second side face **5**. The main electrode portion **22** and the third lead portion **23** are integrally formed. The third lead portion **23** extends from a portion near the third side face **6** in the longer side of the main electrode portion **22** on the second side face **5** side, to the second side face **5**. The area of the main electrode portion **22** is smaller than the area of the main electrode portion **12**, **16**.

Each fourth internal electrode **25**, as shown in FIG. **5**(*a*), has a main electrode portion **26** of a rectangular shape, and a fourth lead portion **27** extending from the main electrode portion **26** so that an end thereof is exposed in the second side face **5**. The main electrode portion **26** and the fourth lead portion **27** are integrally formed. The fourth lead portion **27** extends from a portion near the fourth side face **7** in the longer side of the main electrode portion **26** on the second side face **5** side, to the second side face **5**. The third internal electrode **21** and the fourth internal electrode **25** are located in an identical layer. The area of the main electrode portion **26** is smaller than the area of the main electrode portion **12**, **16**.

The first intermediate internal electrode **30** is located in a layer different from that of the third and fourth internal electrodes **21**, **25**. Namely, the first intermediate internal electrode **30** is opposed to the third and fourth internal electrodes **21**, **25** (main electrode portions **22**, **26**) with the insulator layer **9** in between.

An overlap of the insulator layer **9** with the main electrode portion **22** of the third internal electrode **21** and the first intermediate internal electrode **30** is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the main electrode portion **26** of the fourth internal electrode **25** and the first intermediate internal electrode **30** is a region that substantially produces one capacitance component. Namely, the third and fourth internal electrodes **21**, **25** and the first intermediate internal electrode **30** are arranged with the insulator layer **9** in between so as to form two capacitance components between the third and fourth internal electrodes **21**, **25**. The two capacitance components formed between the third and fourth internal electrodes **21**, **25** are connected in series.

The third intermediate internal electrode **32**, as shown in FIG. **6**(*a*), is located in the same layer as the third and fourth internal electrodes **21**, **25** are. The third intermediate internal electrode **32** is located between the third and fourth internal electrodes **21**, **25**. The third and fourth internal electrodes **21**, **25** and the third intermediate internal electrode **32** are arranged in the order of the third internal electrode **21**, the third intermediate internal electrode **32**, and the fourth internal electrode **25** in the direction from the third side face **6** to the fourth side face **7**.

The second and fourth intermediate internal electrodes **31**, **33**, as shown in FIG. **6**(*b*), are located in an identical layer but layer different from that of the third and fourth internal electrodes **21**, **25** and the third intermediate internal electrode **32**. Namely, the second intermediate internal electrode **31** is opposed to the third internal electrode **21** (main electrode portion **22**) and the third intermediate internal electrode **32** with the insulator layer **9** in between. The fourth intermediate internal electrode **33** is opposed to the fourth internal electrode **25** (main electrode portion **26**) and the third intermediate internal electrode **32** with the insulator layer **9** in between.

An overlap of the insulator layer **9** with the main electrode portion **22** of the third internal electrode **21** and the second intermediate internal electrode **31** is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the second intermediate internal electrode **31** and the third intermediate internal electrode **32** is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the third intermediate internal electrode **32** and the fourth intermediate internal electrode **33** is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the main electrode portion **26** of the fourth internal electrode **25** and the fourth intermediate internal electrode **33** is a region substantially produces one capacitance component. Namely, the third internal electrode **21**, the fourth internal electrode **25**, and the second to fourth intermediate internal electrodes **31**-**33** are arranged with the insulator layer **9** in between so as to form four capacitance components between the third and fourth internal electrodes **21**, **25**. The four capacitance components formed between the third and fourth internal electrodes **21**, **25** are connected in series.

The second internal electrode groups **20** include two types of internal electrode groups, second internal electrode groups **20***a* having the third and fourth internal electrodes **21**, **25** and the first intermediate internal electrode **30**, and second internal electrode groups **20***b* having the third and fourth internal electrodes **21**, **25** and the second to fourth intermediate internal electrodes **31**-**33**.

The widths (W_2, W_3) of the third and fourth lead portions **23**, **27** are set wider than the width (W_1) of the first and second lead portions **13**, **17**. Namely, the length of the exposed part of the third and fourth lead portions **23**, **27** in the second side face **5** is set longer than the length of the exposed part of the first and second lead portions **13**, **17** in the second side face **5**. The width (W_3) of the third and fourth lead portions **23**, **27** of the third and fourth internal electrodes **21**, **25** in each second internal electrode group **20***b* is set larger than the width (W_2) of the third and fourth lead portions **23**, **27** of the third and fourth internal electrodes **21**, **25** in each second internal electrode group **20***a*. Namely, the length of the exposed part of the third and fourth lead portions **23**, **27** in the second internal electrode group **20***b* in the second side face **5** is set longer than the length of the exposed part of the third and fourth lead portions **23**, **27** in the second internal electrode group **20***a* in the second side face **5**. The width of each lead portion **13**, **17**, **23**, **27** is a length in the third direction of the lead portion **13**, **17**, **23**, **27**.

The first and second end faces **2**, **3** face each other in the opposed direction of the first internal electrode **11** and the second internal electrode **15**. Therefore, in a state in which the multilayer capacitor C**1** is mounted on another component, the first to fourth internal electrodes **11**, **15**, **21**, **25** and the first to fourth intermediate internal electrodes **30**-**33** extend in a direction perpendicular to a mount surface of the other component (surface on which the multilayer capacitor C**1** is mounted).

The first terminal electrode **40** is disposed on the second side face **5** of the capacitor element body **1**. The first terminal electrode **40** is formed as extending in the first direction so as to cover all the exposed parts of the first lead portions **13** in the second side face **5** and the exposed parts of the third lead portions **23** in the second side face **5**. The first terminal electrode **40** is physically and electrically connected to each of the first and third lead portions **13**, **23**. This makes all the first and third internal electrodes **11**, **21** electrically and physically connected to the first terminal electrode **40**.

The second terminal electrode **42** is disposed on the second side face **5** of the capacitor element body **1**. The second terminal electrode **42** is formed as extending in the first direction so as to cover all the exposed parts of the second lead portions **17** in the second side face **5** and the exposed parts of the fourth lead portions **27** in the second side face **5**. The second terminal electrode **42** is physically and electrically connected to each of the second and fourth lead portions **17**, **27**. This makes all the second and fourth internal electrodes **15**, **25** electrically and physically connected to the second terminal electrode **42**.

The first and second terminal electrodes **40**, **42** are formed, for example, by applying an electroconductive paste containing an electroconductive metal powder and glass frit, onto the exterior of the capacitor element body **1** and baking it. A plated layer is sometimes formed on the first and second terminal electrodes **40**, **42** after baked, according to need. The application of the electroconductive paste can be implemented by dipping, printing, or the like. The first and second terminal electrodes **40**, **42** are formed as electrically isolated from each other on the surface of the capacitor element body **1**.

In the first embodiment, as described above, one capacitance component is formed in each first internal electrode group **10**, two capacitance components are formed in each second internal electrode group **20***a*, and four capacitance components are formed in each second internal electrode group **20***b*. The two capacitance components formed in the second internal electrode group **20***a* are connected in series and the four capacitance components formed in the second internal electrode group **20***b* are connected in series. Therefore, the total capacitance of the four capacitance components formed in the second internal electrode group **20***b* is smaller than the total capacitance of the two capacitance components formed in the second internal electrode group **20***a*, and the total capacitance of the two capacitance components formed in the second internal electrode group **20***a* is smaller than the capacitance of the capacitance component formed in the first internal electrode group **10**.

In general, the self-resonant frequency (fr) of a capacitor is represented by the equation below, where L is the equivalent series inductance of the capacitor and C the capacitance.

$$fr=(2\pi(L*C)^{1/2})^{-1}$$

Hence, the self-resonant frequency of the capacitor can be changed by changing the equivalent series inductance and/or the capacitance of the capacitor. In this instance, the self-resonant frequency becomes higher with decrease in capacitance. The self-resonant frequency becomes higher with decrease in equivalent series inductance.

In the first embodiment, the relation of $fr_1<fr_{21}<fr_{22}$ holds among the self-resonant frequency (fr_1) due to the one capacitance component in the first internal electrode group **10**, the self-resonant frequency (fr_{21}) due to the two capacitance components in the second internal electrode group **20***a*, and the self-resonant frequency (fr_{22}) due to the four capacitance components in the second internal electrode group **20***b*. As a result, as shown in FIG. **7**, the reduction of impedance is achieved over a wide frequency band. FIG. **7** is a graph showing the impedance (Ω) characteristics against frequency (Hz) of the multilayer capacitor C**1** of the first embodiment. In the graph shown in FIG. **7**, the horizontal axis represents frequency (Hz) and the vertical axis impedance (Ω).

Since in the present embodiment the first and second terminal electrodes **40**, **42** are disposed on the second side face **5** of the capacitor element body **1**, current pathways formed in the multilayer capacitor C**1** become relatively short. As a result, it becomes feasible to reduce the equivalent series inductance of the multilayer capacitor C**1**.

In the present embodiment, the relation of $W_1<W_2<W_3$ is set among the width (W_1) of the first and second lead portions **13**, **17**, the width (W_2) of the third and fourth lead portions **23**, **27** in the second internal electrode group **20***a*, and the width (W_3) of the third and fourth lead portions **23**, **27** in the second internal electrode group **20***b*. This leads to the relation of $L_1>L_{21}>L_{22}$ among the equivalent series inductance (L_1) of the one capacitance component in the first internal electrode group **10**, the equivalent series inductance (L_{21}) of the two capacitance components in the second internal electrode group **20***a*, and the equivalent series inductance (L_{22}) of the four capacitance components in the second internal electrode group **20***b*. As a result, it becomes feasible to further reduce the equivalent series inductance of the multilayer capacitor C**1**.

Incidentally, the equivalent series inductance of the multilayer capacitor C**1** can also be reduced by setting the relation of $W_1>W_2>W_3$ among the widths (W_1, W_2, W_3) of the lead portions **13**, **17**, **23**, **27**. However, when the relation of $W_1>W_2>W_3$ holds among the widths (W_1, W_2, W_3) of the lead portions **13**, **17**, **23**, **27**, the self-resonant frequencies (fr_1, fr_{21}, fr_{22}) come to have close values, which may inhibit the reduction in impedance over the wide band. Therefore, this relation is not preferred.

A modification example of the multilayer capacitor C**1** of the first embodiment will be described below on the basis of FIGS. **8** to **10**. The multilayer capacitor of the present modification example is different in the shapes of the first to fourth internal electrodes **11**, **15**, **21**, **25** from the multilayer capacitor C**1** of the above-described embodiment. In FIGS. **8** to **10** each of (a) and (b) is a view showing a configuration of an internal electrode in the modification example of the first embodiment.

As shown in FIGS. **8** to **10**, the relation of $D_1>D_2>D_3$ is set among a distance (D_1) between the first lead portion **13** and the second lead portion **17**, a distance (D_2) between the third lead portion **23** and the fourth lead portion **27** in the second internal electrode group **20***a*, and a distance (D_3) between the third lead portion **23** and the fourth lead portion **27** in the second internal electrode group **20***b*. The distance (D_1) between the first lead portion **13** and the second lead portion **17** refers, specifically, to the shortest direct distance between a connection between the first lead portion **13** and the first terminal electrode **40** and a connection between the second lead portion **17** and the second terminal electrode **42**. The distances (D_2, D_3) between the third lead portion **23** and the fourth lead portion **27** refer, specifically, to the shortest direct distances between a connection between the third lead portion **23** and the first terminal electrode **40** and a connection between the fourth lead portion **27** and the second terminal electrode **42**.

In the present modification example, there is also the relation of $fr_1<fr_{21}<fr_{22}$ among the self-resonant frequency (fr_1) due to the one capacitance component in the first internal electrode group **10**, the self-resonant frequency (fr_{21}) due to the two capacitance components in the second internal electrode group **20***a*, and the self-resonant frequency (fr_{22}) due to the four capacitance components in the second internal electrode group **20***b*. As a result, the reduction of impedance is achieved over a wide frequency band.

There is the relation of $L_1>L_{21}>L_{22}$ among the equivalent series inductance (L_1) of the one capacitance component in the first internal electrode group **10**, the equivalent series inductance (L_{21}) of the two capacitance components in the second internal electrode group **20***a*, and the equivalent series inductance (L_{22}) of the four capacitance components in the second internal electrode group **20***b*. As a result, it becomes feasible to further reduce the equivalent series inductance of the multilayer capacitor C**1**.

Incidentally, the equivalent series inductance of the multilayer capacitor C**1** can also be reduced by setting the relation of $D_1<D_2<D_3$ among the distances (D_1, D_2, D_3) between the lead portions **13**, **17**, **23**, **27**. However, when the relation of $D_1<D_2<D_3$ holds among the distances (D_1, D_2, D_3) between the lead portions **13**, **17**, **23**, **27**, the self-resonant frequencies (fr_1, fr_{21}, fr_{22}) come to have close values, which may inhibit the reduction of impedance over the wide band. Therefore, this relation is not preferred.

Second Embodiment

A configuration of a multilayer capacitor C**2** according to the second embodiment will be described with reference to FIGS. **11** to **14**. FIG. **11** is a schematic perspective view showing the multilayer capacitor according to the second embodiment. FIG. **12** is an exploded perspective view of a capacitor element body in the multilayer capacitor of the second embodiment. In FIGS. **13** and **14** each of (a) and (b) is a view showing a configuration of an internal electrode.

The multilayer capacitor C**2**, as shown in FIG. **11**, is provided with a capacitor element body **1** of a nearly rectangular parallelepiped shape, a first terminal electrode **80**, and a second terminal electrode **82**. In the present embodiment the second side face **5** is also a mounted surface to be opposed to another component (e.g., a circuit board, an electronic component, or the like).

The multilayer capacitor C**2**, as shown in FIG. **12**, is provided with a plurality of first internal electrode groups **10** and a plurality of second internal electrode groups **20**. Each first internal electrode group **10** has a first internal electrode **51** and a second internal electrode **55**. Each second internal electrode group **20** has a third internal electrode **61**, a fourth internal electrode **65**, and a first intermediate internal electrode **70**. The internal electrodes **51**, **55**, **61**, **65**, **70** are located inside the capacitor element body **1**. Each internal electrode **51**, **55**, **61**, **65**, **70** is made of an electrically conductive material (e.g., a base metal Ni or the like) usually used as internal electrodes in a multilayer electric element. Each internal electrode **51**, **55**, **61**, **65**, **70** is constructed as a sintered body of an electroconductive paste containing the aforementioned electrically conductive material.

Each first internal electrode **51**, as shown in FIG. **13**(*a*), has a main electrode portion **52** of a rectangular shape, and a first lead portion **53** extending from the main electrode portion **52** so that an end thereof is exposed in the first to third side faces **4**, **5**, **6**. The main electrode portion **52** and the first lead portion **53** are integrally formed. The first lead portion **53** extends from an end of the main electrode portion **52** near the third side face **6**, to the first to third side faces **4**, **5**, **6**.

Each second internal electrode **55**, as shown in FIG. **13**(*b*), has a main electrode portion **56** of a rectangular shape, and a second lead portion **57** extending from the main electrode portion **56** so that an end thereof is exposed in the first, second, and fourth side faces **4**, **5**, **7**. The main electrode portion **56** and the second lead portion **57** are integrally formed. The second lead portion **57** extends from an end of the main electrode portion **56** near the fourth side face **7**, to the first, second, and fourth side faces **4**, **5**, **7**.

The main electrode portion **52** of the first internal electrode **51** and the main electrode portion **56** of the second internal electrode **55** are opposed to each other with the insulator layer **9** in between. An overlap of the insulator layer **9** with the main electrode portion **52** of the first internal electrode **51** and the main electrode portion **56** of the second internal electrode **55** is a region that substantially produces one capacitance component. Namely, the first internal electrode **51** and the second internal electrode **55** are arranged with the insulator layer **9** in between so as to form one capacitance component between the first and second internal electrodes **51**, **55**.

Each third internal electrode **61**, as shown in FIG. **14**(*a*), has a main electrode portion **62** of a rectangular shape, and a third lead portion **63** extending from the main electrode portion **62** so that an end thereof is exposed in the first to third side faces **4**, **5**, **6**. The main electrode portion **62** and the third lead portion **63** are integrally formed. The third lead portion **63** extends from an end of the main electrode portion **62** near the third side face **6**, to the first to third side faces **4**, **5**, **6**. The area of the main electrode portion **62** is smaller than the area of the main electrode portions **52**, **56**.

Each fourth internal electrode **65**, as shown in FIG. **14**(*a*), has a main electrode portion **66** of a rectangular shape, and a fourth lead portion **67** extending from the main electrode portion **66** so that an end thereof is exposed in the first, second, and fourth side faces **4**, **5**, **7**. The main electrode portion **66** and the fourth lead portion **67** are integrally formed. The fourth lead portion **67** extends from an end of the main electrode portion **66** near the fourth side face **7**, to the first, second, and fourth side faces **4**, **5**, **7**. The third internal electrode **61** and the fourth internal electrode **65** are located in an identical layer. The area of the main electrode portion **66** is smaller than the area of the main electrode portions **52**, **56**.

The first intermediate internal electrode **70** is located in a layer different from that of the third and fourth internal electrodes **61**, **65**. Namely, the first intermediate internal electrode **70** is opposed to the third and fourth internal electrodes **61**, **65** (main electrode portions **62**, **66**) with the insulator layer **9** in between.

An overlap of the insulator layer **9** with the main electrode portion **62** of the third internal electrode **61** and the first intermediate internal electrode **70** is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the main electrode portion **66** of the fourth internal electrode **65** and the first intermediate internal electrode **70** is a region that substantially produces one capacitance component. Namely, the third and fourth internal electrodes **61**, **65** and the first intermediate internal electrode **70** are arranged with the insulator layer **9** in between so as to form the two capacitance components between the third and fourth internal electrodes **61**, **65**. The two capacitance components formed between the third and fourth internal electrodes **61**, **65** are connected in series.

The first and third lead portions **53**, **63** are exposed in a region of the first to third side faces **4**, **5**, **6** and the second and fourth lead portions **57**, **67** are exposed in a region of the first, second, and fourth side faces **4**, **5**, **7**. A length (X_2) of the exposed part of the third and fourth lead portions **63**, **67** in the exterior of the capacitor element body **1** is set longer than a length (X_1) of the exposed part of the first and second lead portions **53**, **57** in the exterior of the capacitor element body **1**. The length (X_1, X_2) of the exposed part of each lead portion **53**, **57**, **63**, **67** in the exterior of the capacitor element body **1** corresponds to the width of each lead portion **53**, **57**, **63**, **67**.

In the multilayer capacitor C**2**, similarly as in the multilayer capacitor C**1**, the first to fourth internal electrodes **51**, **55**, **61**, **65** and the first intermediate internal electrode **70** also extend in a direction perpendicular to a mount surface of another component (surface on which the multilayer capacitor C**2** is mounted) in a state in which the multilayer capacitor C**2** is mounted on the other component.

The first terminal electrode **80** is disposed so as to cover the entire third side face **6** of the capacitor element body **1** and partially cover the four faces **2**, **3**, **4**, **5** adjacent to the third side face **6**. The first terminal electrode **80** is formed so as to cover all the exposed parts of the first and third lead portions **53**, **63** in the first to third side faces **4**, **5**, **6**. The first terminal electrode **80** is physically and electrically connected to each of the first and third lead portions **53**, **63**. This makes all the first and third internal electrodes **51**, **61** electrically and physically connected to the first terminal electrode **80**.

The second terminal electrode **82** is disposed so as to cover the entire fourth side face **7** of the capacitor element body **1** and partially cover the four faces **2**, **3**, **4**, **5** adjacent to the fourth side face **7**. The second terminal electrode **82** is formed so as to cover all the exposed parts of the second and fourth lead portions **57**, **67** in the first, second, and fourth side faces **4**, **5**, **7**. The second terminal electrode **82** is physically and electrically connected to each of the second and fourth lead portions **57**, **67**. This makes all the second and fourth internal electrodes **55**, **65** electrically and physically connected to the second terminal electrode **82**.

The first and second terminal electrodes **80**, **82** are formed, for example, by applying an electroconductive paste containing an electroconductive metal powder and glass frit, onto the exterior of the capacitor element body **1** and baking it. A plated layer is sometimes formed on the first and second terminal electrodes **80**, **82** after baked, according to need. The application of the electroconductive paste can be implemented by dipping, printing, or the like. The first and second terminal electrodes **80**, **82** are formed as electrically isolated from each other on the surface of the capacitor element body **1**.

In the second embodiment, as described above, one capacitance component is formed in each first internal electrode group **10** and two capacitance components are formed in each second internal electrode group **20**. The two capacitance components formed in the second internal electrode group **20** are connected in series. Therefore, the total capacitance of the two capacitance components formed in the second internal electrode group **20** is smaller than the capacitance of the capacitance component formed in the first internal electrode group **10**.

In the second embodiment there is the relation of $fr_1<fr_2$ between the self-resonant frequency (fr_1) due to the one capacitance component in the first internal electrode group **10** and the self-resonant frequency (fr_2) due to the two capacitance components in the second internal electrode group **20**, whereby the reduction of impedance is achieved over a wide frequency band, as shown in FIG. **15**. FIG. **15** is a graph showing the impedance (Ω) characteristics against frequency (Hz) of the multilayer capacitor C**2** of the second embodiment. In the graph shown in FIG. **15**, the horizontal axis represents frequency (Hz) and the vertical axis impedance (Ω).

Since in the present embodiment a part of the first and second terminal electrodes **80**, **82** is disposed on the second side face **5** of the capacitor element body **1**, current pathways established in the multilayer capacitor C**2** are relatively short. As a result, it becomes feasible to reduce the equivalent series inductance of the multilayer capacitor C**2**.

The relation of $X_1<X_2$ is set between the length (X_1) of the exposed part of the first and second lead portions **53**, **57** in the exterior of the capacitor element body **1** and the length (X_2) of the exposed part of the third and fourth lead portions **63**, **67** in the exterior of the capacitor element body **1**. This leads to the relation of $L_1>L_2$ between the equivalent series inductance (L_1) of the one capacitance component in the first internal electrode group **10** and the equivalent series inductance (L_2) of the two capacitance components in the second internal electrode group **20**, whereby it becomes feasible to further reduce the equivalent series inductance of the multilayer capacitor C**2**.

Incidentally, in the second embodiment the relation of $D_4>D_5$ is set between a distance (D_4) between the first lead portion **53** and the second lead portion **57** and a distance (D_5) between the third lead portion **63** and the fourth lead portion **67**, as shown in FIGS. **13** and **14**. The distance (D_4) between the first lead portion **53** and the second lead portion **57** refers, specifically, to the shortest direct distance between a connection between the first lead portion **53** and the first terminal electrode **80** and a connection between the second lead portion **57** and the second terminal electrode **82**. The distance (D_5) between the third lead portion **63** and the fourth lead portion **67** refers, specifically, to the shortest direct distance between a connection between the third lead portion **63** and the first terminal electrode **80** and a connection between the fourth lead portion **67** and the second terminal electrode **82**.

This leads to the relation of $L_1>L_2$ between the equivalent series inductance (L_1) of the one capacitance component in the first internal electrode group **10** and the equivalent series inductance (L_2) of the two capacitance components in the second internal electrode group **20**. As a result, it becomes feasible to further reduce the equivalent series inductance of the multilayer capacitor C**2**.

Modification examples of the multilayer capacitor C**2** of the second embodiment will be described below on the basis of FIGS. **16** to **19**. The multilayer capacitors of the modification examples are different in the shapes of the first to fourth internal electrodes **51**, **55**, **61**, **65** and the first intermediate internal electrode **70** from the multilayer capacitor C**2** of the above-described embodiment. In FIGS. **16** to **19** each of (a) and (b) is a view showing a configuration of an internal electrode.

First, the configurations of the modification example shown in FIGS. **16** and **17** will be described. As shown in FIG. **16**, the first lead portion **53** is exposed in a partial region of the second and third side faces **5**, **6** and the second lead portions **57** is exposed in a partial region of the second and fourth side faces **5**, **7**. As shown in FIG. **17**, the third lead portion **63** is exposed in a partial region of the second and third side faces **5**, **6** and the fourth lead portion **67** is exposed in a partial region of the second and fourth side faces **5**, **7**. The relation of $X_1<X_2$ is set between the length (X_1) of the exposed part of the first and second lead portions **53**, **57** in the exterior of the capacitor element body **1** and the length (X_2) of the exposed part of the third and fourth lead portions **63**, **67** in the exterior of the capacitor element body **1**.

The relation of $D_4>D_5$ is set between the distance (D_4) between the first lead portion **53** and the second lead portion **57** and the distance (D_5) between the third lead portion **63** and the fourth lead portion **67**.

In the present modification example shown in FIGS. **16** and **17**, there is also the relation of $fr_1<fr_2$ between the self-resonant frequency (fr_1) due to the one capacitance component in the first internal electrode group **10** and the self-resonant frequency (fr_2) due to the two capacitance components in the second internal electrode group **20**. As a result, the reduction of impedance can be achieved over a wide frequency band and it becomes feasible to further reduce the equivalent series inductance.

The configurations of another modification example shown in FIGS. **18** and **19** will be described below. The second internal electrode group **20**, as shown in FIG. **19**, has first intermediate internal electrodes **70***a*, **70***b*. The first intermediate internal electrodes **70***a*, **70***b* are located in an identical layer but layer different from that of the third and fourth internal electrodes **61**, **65**. Namely, the first intermediate internal electrodes **70***a*, **70***b* are opposed to the third and fourth internal electrodes **61**, **65** (main electrode portions **62**, **66**) with the insulator layer **9** in between.

An overlap of the insulator layer **9** with the main electrode portion **62** of the third internal electrode **61** and the first intermediate internal electrode **70***a* is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the main electrode portion **66** of the fourth internal electrode **65** and the first intermediate internal electrode **70***a* is a region that substantially produces one capacitance component. Namely, the third and fourth internal electrodes **61**, **65** and the first intermediate internal electrode **70***a* are arranged with the insulator layer **9** in between so as to form two capacitance components between the third and fourth internal electrodes **61**, **65**. The two capacitance components are connected in series.

An overlap of the insulator layer **9** with the main electrode portion **62** of the third internal electrode **61** and the first intermediate internal electrode **70***b* is a region that substantially produces one capacitance component. An overlap of the insulator layer **9** with the main electrode portion **66** of the fourth internal electrode **65** and the first intermediate internal electrode **70***b* is a region that substantially produces one capacitance component. Namely, the third and fourth internal electrodes **61**, **65** and the first intermediate internal electrode **70***b* are also arranged with the insulator layer **9** in between so as to form two capacitance components between the third and fourth internal electrodes **61**, **65**. The two capacitance components are connected in series.

The two capacitance components connected in series by the first intermediate internal electrode **70***a* and the two capacitance components connected in series by the first intermediate internal electrode **70***b* are connected in parallel.

As shown in FIG. **18**, the first lead portion **53** is exposed in a partial region of the first and third side faces **4**, **6** and in a partial region of the second and third side faces **5**, **6**. The second lead portion **57** is exposed in a partial region of the first and fourth side faces **4**, **7** and in a partial region of the second and fourth side faces **5**, **7**. As shown in FIG. **19**, the third lead portion **63** is exposed in a partial region of the first and third side faces **4**, **6** and in a partial region of the second and third side faces **5**, **6**. The fourth lead portion **67** is exposed in a partial region of the first and fourth side faces **4**, **7** and in a partial region of the second and fourth side faces **5**, **7**. The relation of $X_{11}+X_{12}<X_{21}+X_{22}$ is set between the length ($X_{11}+X_{12}$) of the exposed part of the first and second lead portions **53**, **57** in the exterior of the capacitor element body **1** and the length ($X_{21}+X_{22}$) of the exposed part of the third and fourth lead portions **63**, **67** in the exterior of the capacitor element body **1**.

The relation of $D_4>D_5$ is set between the distance (D_4) between the first lead portion **53** and the second lead portion **57** and the distance (D_5) between the third lead portion **63** and the fourth lead portion **67**.

In the present modification example shown in FIGS. **18** and **19**, the relation of $fr_1<fr_2$ also holds between the self-resonant frequency (fr_1) due to the one capacitance component in the first internal electrode group **10** and the self-resonant frequency (fr_2) due to the two capacitance components in the second internal electrode group **20**. As a result, the reduction of impedance is achieved over a wide frequency band and it is feasible to further reduce the equivalent series inductance.

The above described the preferred embodiments of the present invention, but it is noted that the present invention is not always limited to the above-described embodiments but can be modified in many ways without departing from the scope of the invention.

The numbers and locations of the first and second internal electrode groups are not limited to those in the embodiments and modification examples. The number of laminated insulator layers **9** in the capacitor element body **1** and the number of laminated internal electrodes **11**, **15**, **21**, **25**, **30-33**, **51**, **55**, **61**, **65**, **70**, **70***a*, **70***b* are not limited to the numbers described in the above-described embodiments and modification examples. The shapes of the respective internal electrodes **11**, **15**, **21**, **25**, **30-33**, **51**, **55**, **61**, **65**, **70**, **70***a*, **70***b* are not limited to those in the above-described embodiments and modification examples, either.

The number of types of second internal electrode groups **20** is not limited to the number (one or two) described in the above embodiments and modification examples, but may be three or more. The number of capacitance components connected in series in each second internal electrode group **20** is not limited to the number (two or four) described in the above embodiments and modification examples, either, and the number may be three or five or more. In the second embodiment the two capacitance components are connected in series in each second internal electrode group **20**, but, without having to be limited to this, four capacitance components may be connected in series as in the second internal electrode group **20***b* of the first embodiment.

From the invention thus described, it will be obvious that the invention may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended for inclusion within the scope of the following claims.

What is claimed is:

1. A multilayer capacitor comprising:

a capacitor element body in which a plurality of insulator layers are laminated;

first and second terminal electrodes disposed on an external surface extending in a direction parallel to a laminating direction of the insulator layers, among external surfaces of the capacitor element body;

a first internal electrode group comprising a first internal electrode connected to the first terminal electrode, and a second internal electrode connected to the second terminal electrode; and

a second internal electrode group comprising a third internal electrode connected to the first terminal electrode, a fourth internal electrode connected to the second terminal electrode, and at least one intermediate internal electrode not connected to the first and second terminal electrodes;

wherein the first and second internal electrodes are arranged with the insulator layer in between so as to form a capacitance component between the first and second internal electrodes; and

wherein the third and fourth internal electrodes and the intermediate internal electrode are arranged with the insulator layer in between so as to form two or more capacitance components between the third and fourth internal electrodes,

wherein the first internal electrode has a first lead portion connected to the first terminal electrode,

wherein the second internal electrode has a second lead portion connected to the second terminal electrode,

wherein the third internal electrode has a third lead portion connected to the first terminal electrode,

wherein the fourth internal electrode has a fourth lead portion connected to the second terminal electrode, and

wherein a width of the third and fourth lead portions is larger than a width of the first and second lead portions.

2. The multilayer capacitor according to claim **1**, wherein the second internal electrode group comprises a first intermediate internal electrode opposed to the third and fourth internal electrodes, as said at least one intermediate internal electrode.

3. The multilayer capacitor according to claim **2**, wherein the at least one intermediate internal electrode of the second internal electrode group further comprises second to fourth intermediate internal electrodes,

wherein the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and

wherein the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

4. The multilayer capacitor according to claim **1**, wherein the second internal electrode group comprises second to fourth intermediate internal electrodes as said at least one intermediate internal electrode,

wherein the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and

wherein the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

5. The multilayer capacitor according to claim **1**, wherein the second internal electrode group includes two types of internal electrode groups, an internal electrode group having a first intermediate internal electrode and an internal electrode group having second to fourth intermediate internal electrodes,

wherein the first intermediate internal electrode is opposed to the third and fourth internal electrodes,

wherein the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and wherein the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

6. The multilayer capacitor according to claim **1**,

wherein the first and second internal electrode groups are arranged along the laminating direction of the insulator layers in the capacitor element body.

7. The multilayer capacitor according to claim **1**,

wherein the external surface on which the first and second terminal electrodes are disposed constitutes a mounted surface to be opposed to another component.

8. A multilayer capacitor comprising:

a capacitor element body in which a plurality of insulator layers are laminated;

first and second terminal electrodes disposed on an external surface extending in a direction parallel to a laminating direction of the insulator layers, among external surfaces of the capacitor element body;

a first internal electrode group comprising a first internal electrode connected to the first terminal electrode, and a second internal electrode connected to the second terminal electrode; and

a second internal electrode group comprising a third internal electrode connected to the first terminal electrode, a fourth internal electrode connected to the second terminal electrode, and at least one intermediate internal electrode not connected to the first and second terminal electrodes;

wherein the first and second internal electrodes are arranged with the insulator layer in between so as to form a capacitance component between the first and second internal electrodes; and

wherein the third and fourth internal electrodes and the intermediate internal electrode are arranged with the insulator layer in between so as to form two or more capacitance components between the third and fourth internal electrodes,

wherein the first internal electrode has a first lead portion connected to the first terminal electrode,

wherein the second internal electrode has a second lead portion connected to the second terminal electrode,

wherein the third internal electrode has a third lead portion connected to the first terminal electrode,

wherein the fourth internal electrode has a fourth lead portion connected to the second terminal electrode, and

wherein a distance between the third lead portion and the fourth lead portion is smaller than a distance between the first lead portion and the second lead portion.

9. The multilayer capacitor according to claim **8**, wherein the second internal electrode group comprises a first intermediate internal electrode opposed to the third and fourth internal electrodes, as said at least one intermediate internal electrode.

10. The multilayer capacitor according to claim **9**, wherein the at least one intermediate internal electrode of the second internal electrode group further comprises second to fourth intermediate internal electrodes,

wherein the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and

wherein the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

11. The multilayer capacitor according to claim **8**, wherein the second internal electrode group comprises second to fourth intermediate internal electrodes as said at least one intermediate internal electrode,

wherein the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and

wherein the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

12. The multilayer capacitor according to claim **8**, wherein the second internal electrode group includes two types of internal electrode groups, an internal electrode group having a first intermediate internal electrode and an internal electrode group having second to fourth intermediate internal electrodes,

wherein the first intermediate internal electrode is opposed to the third and fourth internal electrodes,

wherein the second intermediate internal electrode is opposed to the third internal electrode and the third intermediate internal electrode, and

wherein the fourth intermediate internal electrode is opposed to the fourth internal electrode and the third intermediate internal electrode.

13. The multilayer capacitor according to claim **8**,

wherein the first and second internal electrode groups are arranged along the laminating direction of the insulator layers in the capacitor element body.

14. The multilayer capacitor according to claim **8**,

wherein the external surface on which the first and second terminal electrodes are disposed constitutes a mounted surface to be opposed to another component.

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